



Course Libraries 2018/19

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COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Geographical Information Management

Date of first publication/latest revision: 09/05/2018

1. What is the course?

Course information

Course Title	Geographical Information Management
Course code	MSGIMFTC, MSGIMPTC, PDGIMFTC, PDGIMPTC, PCGIMFTC, PCGIMPTC
Academic Year	2018/19
Valid entry routes	MSc, PgDip, PgCert
Additional Exit routes	PgDip, PgCert
Mode of delivery	Full-time, Part-time
Location(s)¹ of Study	Cranfield
School(s)	School of Water, Energy and Environment
Theme	Environment & Agrifood
Centre	Cranfield Soil and Agrifood Institute
Course Director	Dr Toby Waine
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	1st or 2nd class UK honours degree or equivalent; in a science or engineering subject Candidates with other qualifications will be considered according to experience; Where applicable minimum IELTS score of 6.5 or TOEFL 580
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc - one year, Part-time MSc - up to three years, Full-time PgCert - one year, Part-time PgCert - two years, Full-time PgDip - one year, Part-time PgDip - two years
Course Start Month(s)	October: Full-time Part-time: Typically an October start

Institutions delivering the course

This course is delivered by the School of Water, Energy, and Environment where the research interests include remote sensing, GIS and spatial data management.

Cranfield University interacts with the following institutions and in the following ways:

The Course has an Industrial Advisory Panel that formally meets each year. Current members of the Industrial Advisory Panel include representatives from: Airbus Defence and Space; The Joint Research Centre, Italy; and Geospatial Insights Ltd..

In addition, the Royal Institution of Chartered Surveyors (RICS) reviews the course each year. There are currently five members of the review group: one from a surveying practice, one being the RICS external examiner and the remainder from RICS.

Students are involved with field trips off-campus. In recent years these have included the following organisations: New Forest National Park, TrafficMaster, Geoplan, Surrey Satellites, the Medmenham Collection.

Students can undertake their individual research project off campus. In recent years, projects have been undertaken with ESRI UK, Natural England, TCentre for Ecology and Hydrology, Ordnance Survey.

The course benefits from links to a significant number of European Universities through the Cranfield University European Partnership Programme.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited formally by Royal Institution of Chartered Surveyors (RICS) and the Institution of Civil Engineering Surveyors. This accreditation is ongoing and is reviewed annually.

2. What are the aims of the course?

Cranfield University offers this course in order to:

- To provide the participant with the capability to develop practical and sustainable applications of remote sensing, Geographic Information Systems and Global Positioning Systems, based upon emerging scientific principles and technological developments;
- To enable the selection of appropriate processing methods for geo spatial data combined with the design, analysis and integration of field survey techniques;
- To focus on integrated analysis of resource assessments from traditional natural resources and socio-economic surveys by the application of spatial analytic capabilities of GIS

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) exit routes are provided for students who wish to access only parts of the course provided.

This programme is intended for the following range of students:

- Those wishing to work in the geographic information industry
- Those wishing to work for government departments, agencies, NGOs and consultancies applying GI technologies to their particular areas of work
- Those wishing to develop a research career utilising GI data and methods

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Geographical Information Management

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Apply the principles of geographic information management technologies and processes to a range of geospatial problems
- ILO 2. Interpret spatial data to derive pertinent conclusions
- ILO 3. Evaluate geographic information management methodologies to enable the selection of appropriate analysis methods for a range of applications
- ILO 4. Manage geographical information in a sustainable manner to deliver accurate, timely and appropriate data to a range of clients
- ILO 5. Integrate analogue and digital spatial data derived from geographic information management technologies to produce quality-assured solutions
- ILO 6. Advise non remote sensing or geographic information system specialists as to the role and implementation of geographic information management technologies within a range of applications

B. Postgraduate Diploma in Geographical Information Management

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 7. Integrate knowledge, understanding and skills from the taught modules in a real-life situation to address problems faced by industrial clients; creating new problem diagnoses, designs, or system insights; and communicating findings in a professional manner in written, oral and visual forms.

C. MSc in Geographical Information Management

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 8. Define a research question, develop aim(s) and objectives, select and execute a methodology, analyse data, evaluate findings critically and draw justifiable conclusions, demonstrating self-direction and originality of thought.
- ILO 9. To communicate their individual research via a thesis and in an oral presentation in a style suitable for academic and professional audiences.

4. How is the course taught?

The MSc course is taught in three sections: taught modules (40%), a group project (20%), and an individual research project (40%). The taught modules are delivered with one week contact time between October and February. The teaching methods include practical sessions, field visits, lectures, seminars, and presentations.

The Group Project is a group-based activity typically undertaken between March and May.

The Project is designed to integrate knowledge, understanding and skills from the taught modules in a real-life situation.

For the Individual Research Project, each student is allocated a supervisor. Guidance sessions are provided as to what is required from the thesis and oral presentation.

Within the induction week, students will be introduced to personal development planning and asked to reflect on their transferable skills and to take ownership of their personal development during the course. During the group project students will be given training in group-working and project management, and will reflect on their personal development.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Week	0
Aerial Photography and Digital Photogrammetry	10
GIS Fundamentals	10
Spatial Data Management	10
Environmental Resource Survey	10
Spatial Data and the Internet	10

ELECTIVE MODULES:	
One of the following modules:	
Image Processing and Analysis	10
Modelling Environmental Processes	10
Physical Principles of Remote Sensing	10
Applied Environmental Informatics	10
Advanced GIS Methods	10
Landscape Ecology	10
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Week	0
Aerial Photography and Digital Photogrammetry	10
GIS Fundamentals	10
Spatial Data Management	10
Environmental Resource Survey	10
Spatial Data and the Internet	10
Group Project (Full Time Student)	40
ELECTIVE MODULES:	
Image Processing and Analysis OR Modelling Environmental Processes	10
Physical Principles of Remote Sensing OR Applied Environmental Informatics	10
Advanced GIS Methods OR Landscape Ecology	10
(or any 3 for part time students)	
Part Time Students: Group Project OR Dissertation	40
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Induction Week	0
Aerial Photography and Digital Photogrammetry	10
GIS Fundamentals	10
Spatial Data Management	10
Environmental Resource Survey	10
Spatial Data and the Internet	10
Group Project (Full Time Students)	40
Thesis	80
ELECTIVE MODULES:	
Image Processing and Analysis OR Modelling Environmental Processes	10
Physical Principles of Remote Sensing OR Applied Environmental Informatics	10
Advanced GIS Methods OR Landscape Ecology	10
(or any 3 for part time students)	
Part Time Students: Group Project OR Dissertation	40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);^{3 4}

³ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Please see the course structure document for details on the individual elements of the course. Full-time students register for the course in October and are expected to complete the MSc course within 12 calendar months.

This course is also offered on a part-time basis. In such a situation, students typically complete the various components of the course over two or three years. One example is to complete four taught modules and a dissertation in year 1, four taught modules and a thesis and oral presentation in year 2. An alternative is to spread the taught modules over three years completing the dissertation by the end of year 2 and the thesis and oral presentation in year 3.

Part time students would be strongly encouraged to join the course at the start of the new academic year to coincide with induction for full time students. If they however join in year then ad hoc induction sessions can be arranged as required.

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
1	I-ENV-INWK	Induction Week	T Brewer	33		0	Y		01/10/18	05/10/18	N/A	AO	N/A				N/A	
2	I-GIM-A1135	Aerial Photography & Digital Photogrammetry	T Brewer	50		10	Y		08/10/18	12/10/18	40	ICW	100				FT - 20/10/2018 PT - 03/11/2018	July 19
3	I-GIM-A1131	GIS Fundamentals	T Brewer	42		10	Y		22/10/18	26/10/18	40	ICW	100				FT - 03/11/2018	July 19

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment								
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates			
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
																	PT - 17/11/2018		
4	I-GIM-A1134	Spatial Data Management	S Hallett	33		10	N		05/11/18	09/11/18	40	ICW	100					FT - 17/11/2018 PT - 01/12/2018	July 19
5	I-GIM-A1129	Image Processing and Analysis	T Waine	35		10	N		19/11/18	23/11/18	40	ICW	100					FT - 01/12/2018 PT - 15/12/2018	July 19
6	I-EI-A1001	Modelling Environmental Processes	J Meersmans	26		10	Y		19/11/18	23/11/18	40			100	IPRES ICW	60 40	IPRES - FT/PT Week comm: 26/11/18 ICW - FT 01/12/18 PT 15/12/18	July 19	
7	I-GIM-A1130	Physical Principles of Remote Sensing	T Waine	20		10	N		03/12/18	07/12/18	40	ICW	100					FT - 15/12/18 PT - 3/1/19	July 19

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
8	I-EI-A1002	Applied Environmental Informatics	M Rivas Casado	45		10	N		03/12/18	07/12/18	40	ICW	100				FT - 15/12/18 PT - 05/01/19	July 19
9	I-GIM-A1132	Advanced GIS Methods	T Brewer	35		10	N		07/01/19	11/01/19	40	ICW	100				FT - 19/01/2019 PT - 02/02/2019	July 19
10	I-LAM-A1522	Landscape Ecology	R Corstanje	30		10	Y		07/01/19	11/01/19	40	ICW	100				FT - 19/01/19 PT - 02/02/19	July 19
11	I-GIM-A1133	Environmental Resource Survey	J Meersmans	40	3	10	N		21/01/19	25/01/19	40			100	ICW ICW	70 30	FT - 02/02/2019 PT - 16/02/2019	July 19
12	I-GIM-A1136	Spatial Data and the Internet	S Hallett	36.5		10	N		04/02/19	08/02/19	40	ICW	100				FT - 16/02/2019 PT - 02/03/2019	July 19
13	I-ENV-GRPP	Group Project	Supervisors	16		40	Y		18/02/19	03/05/19	50	GPROJ ICW	80 20				GPROJ - 29/04/2019	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Please list all modules that are shared with another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Course(s)/programme(s) that share the module</u>
I-GIM-A1135	Aerial Photography & Digital Photogrammetry	Geographical Information Management	<ul style="list-style-type: none"> • Land Reclamation and Restoration • Safety and Accident Investigation (Air & Rail Transport)
I-GIM-A1131	GIS Fundamentals	Geographical Information Management	<ul style="list-style-type: none"> • Land Reclamation and Restoration • Safety and Accident Investigation (Marine Transport) • REMS EngD
I-EI-A1001	Modelling Environmental Processes	Environmental Water Management	<ul style="list-style-type: none"> • Geographical Information Management • Environmental Engineering
I-LAM-A1522	Landscape Ecology	Land Reclamation and Restoration	<ul style="list-style-type: none"> • Geographical Information Management

7. How are the ILOs assessed?

The following assessment types are utilised:

Students on the MSc will have one taught module assessed as a written examination, seven taught modules assessed as individual coursework, (eight if they do not choose the elective module which is assessed as a written examination), one piece of group project work, and one element assessed by a thesis and an oral presentation.

This approach has been adopted in order to assess the ability of the student to demonstrate their ability in a range of environments.

Assessment and ILO Mapping

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.
2	ICW	ICW		ICW	ICW	ICW
3	ICW	ICW	ICW		ICW	ICW
4	ICW	ICW	ICW		ICW	ICW
11	ICW/ICW	ICW/ICW	ICW/ICW		ICW/ICW	ICW/ICW
12	ICW	ICW		ICW	ICW	ICW
5	ICW	ICW		ICW	ICW	ICW
6	IPRES/ICW	IPRES/ICW	IPRES/ICW		IPRES/ICW	

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.
7	ICW	ICW	ICW		ICW	ICW
8	ICW	ICW	ICW	ICW	ICW	
9	ICW	ICW	ICW	ICW	ICW	ICW
10	ICW	ICW	ICW		ICW	

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 7.
13	GPROJ/ICW
14	I PROJ/IPRES

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 8.	ILO 9.
15	THESIS	OR

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10

(Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the expectations and indicators of sound practice of the QAA Quality Code Chapter B10: Managing Higher Education Provision with Others, with regards to the management and operation of the partnership and that the academic standards and the quality of the student experience are assured in line with the remaining chapters of the QAA Quality Code. The delivery of new partnership provision is ultimately approved by the University's Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

9. What opportunities are graduates likely to have on completing the course?

The career prospects from the course have been excellent. Examples of organisations employing graduates from the course include: Airbus Defence and Security, ESRI, JARIC, local authorities, Natural England, Black and Veatch, universities, research organisations.

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Global Product Development and Management

Date of first publication/latest revision: July 2018

1. What is the course?

Course information

Course Title	MSc in Global Product Development and Management
Course code	MSGPDFTC, MSGPDPTC, PDGPDFTC, PDGPDPTC, PCGPDFTC, PCGPDPTC
Academic Year	2018/19
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time, Part-time
Location(s)¹ of Study	Cranfield University
School(s)	School of Aerospace, Transport and Manufacturing
Theme	Manufacturing
Centre	Manufacturing Informatics Centre
Course Director	Professor Tetsuo Tomiyama
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	Not Applicable
Registration Period(s) available	One year full-time, two-five years part-time

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Institutions delivering the course

This course is delivered by The School of Aerospace, Transport and Manufacturing, Manufacturing Theme, Manufacturing Informatics Centre where the research interests include:

- Product Service Systems
- Product Life Cycle Costing
- Lean Product and Process Development
- Knowledge-Based Engineering
- Mathematical Modelling and Optimisation
- Creative Design
- New Manufacturing Technologies

Teaching and/or assessment is also provided by the School of Management and the School of Water, Energy and Environment.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited formally by Institution of Mechanical Engineers (IMechE) up to and including Academic year 2019-20, Institution of Engineering and Technology (IET) up to and including Academic year 2019-20, Royal Aeronautical Society (RAeS) up to and including Academic year 2019-20, and Institute for Engineering Designers (IED) up to and including Academic year 2018-19.

2. What are the aims of the course?

Cranfield University offers this course in order to:

- Deliver a premium high M-level course which aims at ambitious international students and mid-career professionals who want to boost their career prospects within the global market.
- Introduces cutting edge technology through an industry oriented education scheme.
- Improve the employability of students ready to manage issues arising with an increasingly globalised world.

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) exit routes are provided for students who wish to access only parts of the course provided.

This programme is intended for the following range of students:

- Mid-career professionals who want to boost their career.
- Ambitious high quality students with an international background.
- Talented students with a high grade BSc level.

3. What should students expect to achieve in completing the course?**Award intended learning outcomes (ILOs) (skills and knowledge).****A. Postgraduate Certificate**

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Evaluate the up-to-date methods and techniques in global product development and management.
- ILO 2. Assess the use of modern tools to facilitate product engineering, including information systems, management tools and cost engineering software packages.
- ILO 3. Apply the principles of requirements engineering and management to reduce product engineering time and cost.
- ILO 4. Analyse how IT tools and technologies are used for product evaluation.
- ILO 5. Act as a global player in a fictive product development scenario.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 6. Demonstrate knowledge and critical understanding of a broad range of product development approaches.
- ILO 7. Compare state-of-the-art techniques for product development.
- ILO 8. Design new products and services by integrating various knowledge.
- ILO 9. Demonstrate skills to professionally manage culture and communication issues in product development.
- ILO 10. Demonstrate advance international communication skills.
- ILO 11. Demonstrate leadership skills to run individually small international projects.
- ILO 12. Become a well informed and educated person being able to bridge/ interface/ communicate management and workshop decisions.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 13. Identify relevant areas of previous research, placing them in context with a research, project and providing critical appraisal.
- ILO 14. Demonstrate knowledge and understanding of facts, concepts, principles and theories and articulate these through reasoned analysis and discussion.
- ILO 15. Analyse the background to an area of research, justify the research methodologies and discuss the main findings and conclusions in a scholarly written report and a viva voce examination.
- ILO 16. Demonstrate the skill to perform a research project in a clear and concise manner.
- ILO 17. Explain and practice the concept of scientific work. This includes that the student will be able to identify new research ideas, concepts or methodologies, develop experiments or case studies, and analyse the results systematically as well as justify the whole process of arriving at the results.
- ILO 18. Produce project aims, objectives, risk assessment and time lines for a research project.
- ILO 19. Write a clear and concise research report using correct citations and showing a systematic structure of thoughts.

4. How is the course taught?

Students will be supported in their learning and personal development in modules given in the form of lecture, group/individual coursework, and personal study based on the materials available through the University's virtual learning environments (VLEs). Following modes of learning will be available depending on the subject:

- Remote on-line education delivered by international lecturers via internet.
- Interactive role plays.
- Mini-group project of 2 days as part of the module (contained within the one week module).
- Students will be provided with pre-course and post-course reading and assessment as dictated by the individual course modules. It is intended that all lecture material will be made available through the VLEs.
- Research and private study is necessary for the successful completion of these projects which also enhances knowledge and individual study abilities.
- Formative feedback on assessed assignments enhances the learning process and informal feedback on non-assessed individual or group exercises are also used.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 2-9 (Select 6)	60
ELECTIVE MODULES:	
None	
RECOMMENDED MODULE:	
Induction	0
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 2-9 Group Project for full-time students (10a) or Dissertation for part-time students (10b)	80 40
ELECTIVE MODULES:	
None	
RECOMMENDED MODULE:	
Induction	0

TOTAL:	120
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C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 2-9	80
Group Project for full-time students (10a) or Dissertation for part-time students (10b)	40
Individual Research Project (11)	80
ELECTIVE MODULES:	
None	
RECOMMENDED MODULE:	
Induction	0
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);^{3 4}
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);

³ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- If, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
- it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in October and are expected to complete the course within 12 calendar months.

This course is also offered on a part-time basis. In such a situation, students typically complete the various components of the course over two or three years. Typical case is to complete four taught modules plus a Dissertation in year 1 and the remainder of the modules plus the Thesis in year two and/or year 3.

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
1	I-MAN-INWK	Induction	Dr Konstantinos Salonitis	22		0	Y		25/09/18	29/09/18	N/A	AO	N/A				N/A	
2	I-ICI-A1019	Design Technology and Prototyping	Matthew Collins	38		10	Y		05/11/18	09/11/18	40 40	ICW	100				29/11/18	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
3	I-MNU-A1034	Operations Management	Prof Charalampos (Harris) Makatsoris	32		10	Y		01/10/18	05/10/18	40	EX	100				26/10/18	September 2019.
4	I-MNU-A1038	Supply Chain Management	Dr Ahmed Al-Ashaab	32		10	Y		14/01/19	18/01/19	40				ICW	100	FT08/02/19 PT22/02/19	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
5	I-KME-A1022	Design Driven Innovation Processes	Prof Tetsuo Tomiyama	32		10	Y		15/10/18	19/10/18	40			100 MULTI	GCW GPRES ICW	50 25 25	FT09/11/18 PT23/11/18	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
6	I-MNU-A1018	General Management	Mr Matthew Caffrey	32		10	Y		19/11/18	23/11/18	40	EX	100				02/01/19	September 2019
7	I-GPD-A1505	Lean Product Development	Dr Ahmed Al-Ashaab	32		10	N		26/11/18	30/11/18	40	GCW	100				FT14/01/19 PT28/01/19	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
8	I-KME-A1037	Enterprise Modelling	Dr John Ahmet Erkoyuncu	32		10	Y		07/01/19	11/01/19	40			100 MULTI	ICW GCW	60 40	FT01/02/19 PT15/02/19	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
9																		
9	I-GPD-A1507	Digital Engineering	Dr John Erkoyuncu	32		10	N		21/01/18	25/01/18	40	EX	100				wc 28/01/19	September 2019
10a	I-MAT-GRPP	Group Project for Full Time Students	Dr David Ayre	20		40	Y		04/02/19	26/04/19				80 MULTI 20 MULTI	GPRES GPROJ ICW observed behaviour	16 64 10 10	08/05/19 30/04/19 30/04/19	
10b	I-MAT-DISS	Dissertation for Part Time Students	Dr Konstantinos Salonitis	20		40	Y		01/02/19	30/08/19		ICW	100				30/08/19	
11	I-MNU-THESIS	Individual Research Project	Dr Muhammad Khan	20		80	Y		29/04/19	02/09/19		THESIS OR	90 10				30/08/19 02/09/19	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
I-MAN-INWK	Induction	Engineering and Management of Manufacturing Systems	Engineering & Management of Manufacturing Systems, Management and Information Systems, Knowledge Management for Innovation (not currently running), Aerospace Manufacturing, Cyber-Secure Manufacturing
I-	Technology and Prototyping	Global Product Development and Management	
I-GPD-A1505	Lean Product Development	Global Product Development and Management	Manufacturing Technology and Management
I-MNU-A1034	Operations Management	Engineering and Management of Manufacturing Systems	Manufacturing Technology and Management, Engineering & Management of Manufacturing Systems, Management and Information Systems, Manufacturing, Cyber-Secure Manufacturing
I-KME-A1022	Design Driven Innovation Processes	Global Product Development and Management	Knowledge Management for Innovation (not currently running)
I-MNU-A1018	General Management	Engineering and Management of Manufacturing Systems	Advanced Materials, Applied Nanotechnology, Manufacturing Technology and Management, Management and Information Systems, Knowledge Management for Innovation (not currently running), Engineering & Management of Manufacturing Systems
I-KME-A1037	Enterprise Modelling	Management and Information Systems	Management and Information Systems
I-MAT-DISS	Dissertation for Part Time Students	Manufacturing Technology and Materials Programme	Advanced Materials, Aerospace Materials, Applied Nanotechnology, Manufacturing Technology & Management, Aerospace Manufacturing, Engineering & Management of Manufacturing Systems, Knowledge Management for Innovation (not currently running), Management and Information Systems, Cyber-Secure Manufacturing, Welding Engineering
I-MAT-GRPP	Group Project for Full Time Students	Manufacturing Technology and Materials	Advanced Materials, Aerospace Materials, Applied Nanotechnology, Manufacturing

		Programme	Technology & Management, Engineering & Management of Manufacturing Systems, Management and Information Systems, Knowledge Management for Innovation (not currently running), Aerospace Manufacturing, Cyber-Secure Manufacturing, Welding Engineering
I-MNU-THESIS	Individual Research Project	Aerospace Manufacturing	Engineering & Management of Manufacturing Systems, Management and Information Systems, Knowledge Management for Innovation (not currently running), Cyber-Secure Manufacturing, Advanced Materials, Aerospace Materials, Applied Nanotechnology, Manufacturing Technology & Management, Welding Engineering

7. How are the ILOs assessed?

The course uses a range of assessment types. Students can expect to have 3 written examinations (Operation Management, General Management, and Decision Engineering), 5 pieces of assessment by submitted work and 2 elements of assessment by presentation or viva. The course is assessed as three elements:

- Taught modules (40%) are assessed by in-module assessment (including coursework, which focuses on application of principles studied and class tests, which support underpinning knowledge) or examination;
- Group project (20%) is assessed by means of a written group report and presentations.
- Individual thesis project (40%) is assessed by a thesis and an oral examination.

This approach has been adopted because the course focuses on product development that requires coursework. Assignment type assessment is the best for such modules.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5
2		ICW	ICW	ICW	
3	EX				EX
4	GCW	GCW	GCW		GCW

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5
5	GCW	GCW	GCW		GCW
6	EX				
7	GCW	GCW	GCW		GCW
8	ICW	ICW		ICW	
9	EX	EX		EX	

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 6	ILO 7	ILO 8	ILO 9	ILO 10	ILO 11	ILO 12
10a	GPRES GPROJ ICW						
10b	ICW						

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 13	ILO 14	ILO 15	ILO 16	ILO 17	ILO 18	ILO 19
11	THESIS OR						

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher

Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review. For collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focussed Review which looks at each course in depth. In addition occasional site inspection visits are made.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

9. What opportunities are graduates likely to have on completing the course?

The course is designed to equip the students with all the knowledge and skills necessary to work successfully in integrated international project teams. The close collaboration of the course with industry improves the employability of the students immediately. Exposing students to well-known industry broadens the student's horizon and introduces the student to industrial best practice. Working with worldwide well-known brands improves the vita of the students. A placement within industry also leverages the distance between the potential new employee – the student – and the potential employer.

In addition, the qualification obtained will support their professional development towards Incorporated or Chartered Engineer status (after accreditation).



COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Guided Weapon Systems

Date of first publication/latest revision: 03/09/18

1. What is the course?

Course information

Course Title	Guided Weapon Systems
Course code	MSGWSFTR, PDGWSFTR, PCGWSFTR, MSGWSPTR, PDGWSPTR, PCGWSPTR SPGWSPTR
Academic Year	2018/19
Valid entry routes	MSc, PgDip, PgCert
Exit routes	PgDip, PgCert
Mode of delivery	Full-time/Part time
Location(s)¹ of Study	Shrivenham
School(s)	Cranfield Defence & Security
Theme	Defence and Security
Centre	Centre for Defence Engineering
Course Director	Dr Derek Bray
Awarding Body	Cranfield University
Is this an AP Contract course?²	Yes
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements; additionally an IELTS score of 7.0 is usually required by students for whom English is not a first language.
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Benchmark Statement(s)	N/A
Registration Period(s) available	1 year Full-time, 5 years Part-time
Course Start Month(s)	September

Institutions delivering the course

This course is primarily delivered by the Cranfield School of Defence and Security, where the research interests include:

GW control, guidance, propulsion, aerodynamics, EO/IR systems, imaging systems, radar systems, warheads, materials, vibrations, aeroelasticity, lethality etc.

Cranfield University interacts with the following institutions and in the following ways:

- Industrial visits to: MBDA (Stevenage), Dstl (Portsmouth West), Roxel (Summerfield), Thales (Belfast and Basingstoke), Royal Navy (HMS Collingwood and Portsmouth Dockyard), DI (London).
- Industrial lectures from MBDA and Thales on the subjects of project management, fuzing, systems engineering, software engineering and GW electronics engineering.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited formally by RAeS until 2021.

2. What are the aims of the course?

The aim of the course is to provide students with a detailed knowledge and understanding of guided weapon systems, such that they are fully equipped for roles in defence intelligence and acquisition, involving the specification and analysis of such systems, working individually or as part of a team. It also enables students to carry out an in-depth investigation into an area of GW technology to further enhance their analytical capability.

The main objective of the course is to bring together the wide variety of disciplines constituting guided weapons technology and to present them in an integrated manner. Interactions between one field and another are emphasized throughout. The GWS course is now in its 65th consecutive year and satisfies a requirement for specialists trained in the field of guided weapons systems. Graduates of this course go on to work in defence analysis and intelligence, research establishments and education in the UK and abroad. It attracts students from RN, RAF and civil services in the UK, and increasingly from a number of other IDT-cleared countries, including Australia, Canada, USA, Greece, Netherlands, Brazil, India and Italy, and is seen as an essential prerequisite for a number of RAF, RN and RAAF jobs. The only other course of its kind is at the Naval Postgraduate School, Monterey in California (which runs over 2 years).

The number of students attending the course has been reasonably consistent over the past ten years, typically ten to thirteen students per year, roughly 50% UK and 50% overseas. It has many parallels with the Military Electronics Systems Engineering (MESE) course at Shrivenham and also shares many modules with it.

This programme is intended for the following range of students:

It is of primary benefit to services personnel who are about to be posted into GW-related positions with organizations such as DI, DSTL and DE&S (and their international equivalents). It would also be eminently suitable for anyone intending to embark upon a GW-based career in industry.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Investigate and appraise, via written and spoken communicative means, the key advanced technological disciplines associated with modern guided weapons (radar systems, EO/IR systems, propulsion, aerodynamics, control and guidance).
- ILO 2. Review and justify performance variations in mechanical and electrical sub-systems relative to the capabilities of a platform and appropriately investigate and analyse the key sub-systems that make up a guided weapon, through a wide range of modelling, simulation, synthesis and experimental methods.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 3. Establish and justify, via written and spoken communicative means, appropriate selection criteria, and the inherent inter-linked constraints for each of the major technical disciplines associated with modern guided weapons technology (e.g. signal processing, radar EW, structures, warheads, vibrations, aeroelasticity, materials, power supplies, explosives, etc.).
- ILO 4. Propose and develop the design, operation and performance of a modern guided weapon and be able to discuss the findings in both written and viva voce examinations.
- ILO 5. Assess and appraise, confidently and correctly using both written and oral communicative means, the principal trade-offs required to produce a successful guided weapon design.
- ILO 6. Formulate and solve detailed calculations in order to fulfil a given complete missile system design requirement, including a detailed assessment of the target threat characteristics and then propose strategies, involving appropriate GW system and sub-system designs, to optimise the eventual system design based upon appropriate multi-disciplinary methods.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 7. Assess new research ideas, concepts or methodologies through the use of a variety of techniques such as experimentation, analytical models and numerical models in order to perform an extended investigation into a given facet of a missile-related problem.
- ILO 8. Investigate research methodology tools in an extended GW-related study, incorporating recognised project management principles.
- ILO 9. Appraise, assess and document an extended research project in the field of GW requiring elements of information retrieval, modelling, experimentation and theoretical analysis.

4. How is the course taught?

The course is delivered by conventional and traditional academic means. Although the course is specified and described in modular terms, these modules will be integrated as best as practicably possible into a continuous taught phase (for those enrolled on the Full-Time MSc programme). Apart from standard academic lectures, course delivery also includes the following:

- Numerous visits to a wide variety of relevant industrial and military establishments: MBDA (Stevenage), Dstl (Portsmouth West), Roxel (Summerfield), Thales (Belfast and Basingstoke), Royal Navy (HMS Collingwood and Portsmouth Dockyard), DI (London). These visits will be scheduled as far as practicably possible to maximise possible attendance by Part-Time students (within applied security classification limitations). They are intended to enhance student's understanding of GW-related subject areas but are not assessed.
- Visiting lecturers (industry) using appropriate subject matter experts (project management, systems engineering, software engineering, electronics engineering, etc.).
- A parametric study (software-based missile design exercise).
- Tutorials (complete missile design exercises).
- Comprehensive use of the Virtual Learning Environment (VLE), with an increasing tendency towards Technology Enhanced Learning (TEL) methods. This is especially pertinent for the "Introductory & Foundation Skills" module, largely comprising studies in maths and Matlab/Simulink programming, along with the necessary induction sessions regarding the Library, IT, VLE, Turnitin, etc. It is envisaged that much of this module will be delivered via pre-reading and VLE means, with self-assessment in the future. It is appreciated that changes will be introduced into the Course Management with the introduction of the Part-time course options, particularly regarding student experience and progression. The Course Team will be appreciative of this and take appropriate measures to minimise any detrimental effects to the students. This will be done through the Course Director keeping in contact with the part-time students and having regular meetings and consultation with appropriate members of the SAS team and Academic Registry.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 1: Introductory & Foundation Studies (zero credits)	0
Module 3. EO & IR Systems 1	10
Module 4. Radar Principles	10
Module 5. GW Propulsion & Aerodynamics Theory	10
Module 6. GW Control Theory	10
ELECTIVE MODULES:	
Plus, any two of:	
Module 2. Signal Processing, Statistics & Analysis	10
Module 7. GW Applications - Control & Guidance - must be taken after pre-requisite module 6	10
Module 8. GW - Propulsion & Aerodynamics Applications - must be taken after prerequisite module 5	10
Module 9. Radar EW - must be taken after pre-requisite module 4	10
Module 10. EO & IR Systems 2 - must be taken after pre-requisite module 3	10
Module 11. GW Warheads, Explosives & Materials	10
Module 12. GW Structures, Aeroelasticity & Power Supplies	10
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 130 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 1: Introductory & Foundation Studies (zero credits)	0
Module 2. Signal Processing, Statistics & Analysis	10
Module 3. EO & IR Systems 1	10
Module 4. Radar Principles	10
Module 5. GW Propulsion & Aerodynamics Theory	10
Module 6. GW Control Theory	10
Module 7. GW Applications - Control & Guidance - must be taken after pre-requisite module 6	10
Module 8. GW - Propulsion & Aerodynamics Applications - must be taken after pre-requisite module 5	10
Module 9. Radar EW - must be taken after pre-requisite module 4	10
Module 10. EO & IR Systems 2 - must be taken after pre-requisite module 3	10

Module 11. GW Warheads, Explosives & Materials	10
Module 12. GW Structures, Aeroelasticity & Power Supplies	10
Module 13. Parametric Study - must be taken after pre-requisite modules 7 and 8	5
Module 14. GW Systems	15
ELECTIVE MODULES:	
N/A	
TOTAL:	130

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Module 1: Introductory & Foundation Studies (zero credits)	0
Module 2. Signal Processing, Statistics & Analysis	10
Module 3. EO & IR Systems 1	10
Module 4. Radar Principles	10
Module 5. GW Propulsion & Aerodynamics Theory	10
Module 6. GW Control Theory	10
Module 7. GW Applications - Control & Guidance - must be taken after pre-requisite module 6	10
Module 8. GW - Propulsion & Aerodynamics Applications - must be taken after pre-requisite module 5	10
Module 9. Radar EW - must be taken after pre-requisite module 4	10
Module 10. EO & IR Systems 2 - must be taken after pre-requisite module 3	10
Module 11. GW Warheads, Explosives & Materials	10
Module 12. GW Structures, Aeroelasticity & Power Supplies	10
Module 13. Parametric Study - must be taken after pre-requisite modules 7 and 8	5
Module 14. GW Systems	15
Module 15. Research Project	70
ELECTIVE MODULES:	
N/A	
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;

- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate’s Education Committee);^{3 4}
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 12 calendar months.

Part-time students register for the course in September and are expected to complete the course within 5 years. The maximum registration period for the Part-Time MSc programme is five years.

Each 10-credit module is taught over a single week, with the following week kept free of structured teaching to allow time for more independent learning and reflection, especially for the Full-time students. Most industrial visits, if appropriate, are also scheduled for the second week, with Part-Time students offered the opportunity to attend as far as practicably possible. The main exception is the 15-credit GW Systems module, which runs over two weeks.

A thesis workshop will be programmed into the course schedule in March, which will generally be suitable for all Full-time and most Part-time students. A separate workshop will be organised, in September, for Part-time students for which this scheduling is deemed to be unsuitable. The Full-time course is generally structured in three distinct and chronological phases: firstly “theory” modules, secondly “applications” modules and thirdly “systems” modules. Some modules may therefore only be taken after its relevant pre-requisite module has been taken (and passed). The module descriptors will reflect all such pre-requisites. In particular, they are:

³ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a “key assessment” under the previous Assessment Rules).

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student’s overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven’t failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair’s Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- EO/IR Systems 1 is a pre-requisite for EO/IR Systems 2.
- Radar Principles is a pre-requisite for Radar EW.
- GW Control Theory is a pre-requisite for GW Applications - Control & Guidance.
- GW Propulsion & Aerodynamics Theory is a pre-requisite for GW - Propulsion & Aerodynamics Applications.
- Both GW - Applications Control and Guidance and GW Propulsion & Aerodynamics Applications are prerequisites for the Parametric Study.

The course structure (module breakdown) for both the Full-time and Part-time versions of the PgCert, PgDip and MSc qualifications are as follows:

PgCert Guided Weapon Systems (60 credits)

- **Compulsory Modules**

Module 1: Introductory & Foundation Studies (zero credits)

Module 3. EO & IR Systems 1

Module 4. Radar Principles

Module 5. GW Propulsion & Aerodynamics Theory

Module 6. GW Control Theory

- **Elective Modules**

Plus, any two of:

Module 2. Signal Processing, Statistics & Analysis

Module 7. GW Applications - Control & Guidance - must be taken after pre-requisite module 6

Module 8. GW - Propulsion & Aerodynamics Applications - must be taken after prerequisite module 5

Module 9. Radar EW - must be taken after pre-requisite module 4

Module 10. EO & IR Systems 2 - must be taken after pre-requisite module 3

Module 11. GW Warheads, Explosives & Materials

Module 12. GW Structures, Aeroelasticity & Power Supplies

Typical 3 Year (Part-Time) PgCert Programme Plan

The following plan shows how a typical part-time student could complete the PgCert programme within a three year time-frame, though there are many other ways in which this could be done, dependent on an individual's elective module selection.

- Year 1:
 - Module 1: Introductory & Foundation Studies (September)
 - Module 6: GW Control Theory (December)
 - Module 7: GW Applications - Control & Guidance (February)
- Year 2:
 - Module 4: Radar Principles (October)
 - Module 5: GW Propulsion & Aerodynamics Theory (November)
 - Module 8: GW - Propulsion & Aerodynamics Applications (March)
- Year 3:
 - Module 3: EO & IR Systems 1 (October)
 - Module 10: EO & IR Systems 2 (November)

PgDip Guided Weapon Systems Candidates (130 credits)

All of the above PgCert compulsory and elective modules, plus:

Module 13. Parametric Study - must be taken after pre-requisite modules 7 and 8

Module 14. GW Systems

MSc Guided Weapon Systems (200 credits)

All of the above PgDip modules plus an individual project

Typical 5 Year (Part-Time) MSc Programme Plan

The following plan shows how a part-time student could complete the MSc programme within a five year time-frame.

- Year 1:
 - Module 1: Introductory & Foundation Studies (September)
 - Module 4: Radar Principles (October)
 - Module 6: GW Control Theory (December)
 - Module 11: GW Warheads, Explosives & Materials (January)
 - Module 12: GW Structures, Aeroelasticity & Power Supplies (February)
- Year 2:
 - Module 2: Signal Processing, Statistics & Analysis (September)
 - Module 5: GW Propulsion & Aerodynamics Theory (November)
 - Module 7: GW Applications - Control & Guidance (February)
 - Module 8: GW - Propulsion & Aerodynamics Applications (March)
- Year 3:
 - Module 3: EO & IR Systems 1 (October)
 - Module 9: Radar EW (January)
 - Module 10: EO & IR Systems 2 (November)
- Year 4:
 - Commence Individual Project (Sept to July)
 - Module 13: Parametric Study (March)
 - Module 14: GW Systems (April)
- Year 5:
 - Thesis workshop (Sept)
 - Complete Individual Project (Sept to July)

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
1	R-GWS-IFS	Introductory and Foundation Studies	Dr D Bray	20		0	N	03/09/18	03/09/18	07/09/18	N/A	AO	N/A				N/A	
2	R-MES-SPSA	Signal Processing, Statistics & Analysis	Dr P Barker	30		10	Y	01/10/18	01/10/18	05/10/18	50			100	ICW ICW	50 50	02/11/18(FT &PT) 02/11/18 (FT & PT)	TBC TBC

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
3	R-MES-EOIS1	Electro-Optics & Infrared Systems 1	Dr D B James	32		10	Y	03/12/18	03/12/18	07/12/18	50	EX	100				19/12/18 (FT & PT)	TBC
4	R-MES-RP	Radar Principles	Dr A Balleri	30		10	Y	15/10/18	15/10/18	19/10/18	50	ICW	100				16/11/18 (FT & PT)	TBC (FT & PT)
5	R-GWS-GWPAT	Guided Weapons Propulsion & Aerodynamics Theory	Dr D Bray	28		10	N	17/09/18	17/09/18	21/09/18	50	OR	75				09-10/10/18	10/12/18
											50	IPRAC	25				26/10/18 (FT) 16/11/18 (PT)	TBC (FT & PT)
6	R-GWS-GWCT	Guided Weapons Control Theory	Dr D Galvao-Wall	30		10	N	29/10/18	29/10/18	02/11/18	50	OR	75				11-12/12/18	01/02/19
											50	ICW	25				16/01/19 (FT) 06/02/19 (PT)	TBC (FT & PT)
7	R-GWS-GWACG	Guided Weapons Applications – Control & Guidance	Dr J T Economou	30		10	N	11/02/19	11/02/19	15/02/19	50	EX	75				20/03/19	16/05/19
											50	ICW	25				10/04/19 (FT) 01/05/19 (PT)	TBC (FT & PT)
8	R-GWS-GWAPA	Guided Weapons	Dr D Bray	28		10	N	25/02/19	25/02/19	01/03/19	40	EX	50				22/03/19	17/05/19

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
		Propulsion & Aerodynamics Applications								40	IPRAC	50				05/04/19 (FT) 26/04/19 (PT)	07/06/19 (FT & PT)	
9	R-MES-REW	Radar Electronic Warfare	Mr I Vagias	30		10	Y	04/02/19	04/02/19	08/02/19	50	ICW	100				08/03/19 (FT & PT)	TBC (FT & PT)
10	R-MES-EOIS2	Electro-Optics and Infrared Systems II	Dr D B James	32		10	Y	07/01/19	07/01/19	11/01/19	40	ICW	100				08/02/19 (FT & PT)	TBC
11	R-GWS-GWA	Guided Weapons Warheads, Explosives & Materials	Dr G Kister	30		10	N	12/11/18	12/11/18	16/11/18	40	EX	75				17/12/18	01/02/19
											40	ICW	25				18/01/19 (FT&PT)	04/03/19(FT) 22/03/19 (PT)
12	R-GWS-GWA2	Guided Weapons Structures, Aeroelasticity & Power Supplies	Dr A Saddington	30		10	N	21/01/19	21/01/19	25/01/19	40	EX	75				21/02/19	20/05/19
											40	ICW	25				06/03/19 (FT) 27/03/19 (PT)	TBC (FT&PT)
13	R-GWS-PS	Parametric Study	Dr A J Saddington	34		5	N	11/03/19	11/03/19	15/03/19	50	GPRAC	75				11/04/19 (FT&PT)	(FT&PT) (FT&PT)
											50	GPRES	25				27/03/19	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment								
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates			
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
																	(FT&PT)		
14	R-GWS-GWSLS A	Guided Weapon Systems	Dr D Bray	48		15	N	25/03/19	25/03/19	26/04/19	50	OR	50					01 & 02/05/19	22/05/19
											50	ICW	50					15/05/19 (FT) 05/06/19(PT)	TBC
15	R-GWS-DISS	Research Project	Dr D Galvao-Wall	3		70	N	07/01/19	01/01/19	26/07/19	50	THESIS	100					26/07/19 (FT & PT)	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
R-MES-SPSA	Signal Processing, Statistics & Analysis	Military Electronic Systems Engineering	Guided Weapon Systems
R-MES-EOIS1	Electro-Optics & Infrared Systems 1	Military Electronic Systems Engineering	Guided Weapon Systems
R-MES-RP	Radar Principles	Military Electronic Systems Engineering	Guided Weapon Systems
R-MES-REW	Radar Electronic Warfare	Military Electronic Systems Engineering	Guided Weapon Systems
R-MES-EOIS2	Electro-Optics & Infrared Systems 2	Military Electronic Systems Engineering	Guided Weapon Systems

7. How are the ILOs assessed?

The course uses a wide range of assessment types. Students can expect to have written examinations (both open-book and closed-book), oral examinations (in the subjects of propulsion, aerodynamics, control and GW systems) and a large number of submitted work assessments. There will also be some group activities, e.g. in the Parametric Study, Radar Principles and GW Systems modules. The individual project will be assessed via dissertation submission. This provides a balanced approach to the overall course assessment.

Assessment and ILO Mapping

A. Postgraduate Certificate & Postgraduate Diploma

The Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	PgCert		PgDip			
	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
1	AO	AO	AO			
2	ICW	ICW	ICW			
3	EX	EX	EX			
4	ICW	ICW	ICW			
5	OR & IPRAC	OR & IPRAC	OR & IPRAC			
6	OR & ICW	OR & ICW	OR & ICW			
7	EX & ICW	EX & ICW	EX & ICW			
8	EX &	EX &	EX &			

Award ILOs Module No.	PgCert		PgDip			
	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
	IPRAC	IPRAC	IPRAC			
9	ICW	ICW	ICW			
10	ICW	ICW	ICW			
11	EX & ICW	EX & ICW	EX & ICW			
12	EX & ICW	EX & ICW	EX & ICW			
13	GPRES & GPRA C					
14	OR & ICW	OR & ICW				

B. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 7	ILO 8	ILO 9
15	THESIS	THESIS	THESIS

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Not applicable

Title	Modules Covered	Assessment	
		Type	Weight (%)
N/A			

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as

advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the expectations and indicators of sound practice of the QAA Quality Code Chapter B10: Managing Higher Education Provision with Others, with regards to the management and operation of the partnership and that the academic standards and the quality of the student experience are assured in line with the remaining chapters of the QAA Quality Code. The delivery of new partnership provision is ultimately approved by the University's Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that:

the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

9. What opportunities are graduates likely to have on completing the course?

Nearly all students in recent years have been directly sponsored to undertake the course with a subsequent specific weapons-related position in mind. It is envisaged that this will remain the case in the foreseeable near and mid-terms, though the availability of PgCert and PgDip exit routes, and the possibility for taking the course on a Part-Time basis, may eventually change the nature of the student profile. The field of guided weapon systems technology is ever-changing and there are many opportunities within industrial companies (such as Thales and MBDA in the UK) for successful GWS students.

COURSE SPECIFICATION



Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Information Capability Management

Date of first publication/latest revision: June 2018

1. What is the course?

Course information

Course Title	Information Capability Management
Course code	MSICMFTR – PDICMFTR – PCICMFTR – MSICMPTR - PDICMPTR- PCICMPTR - SPICMPTR
Academic Year	2018/19
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full time, part time and short course for credit
Location(s)¹ of Study	Shrivenham
School(s)	Cranfield Defence and Security
Theme	Defence and Security
Centre	Centre for Cyber Security and Information Systems
Course Director	Mr Ross Harris
Awarding Body	Cranfield University
Is this an AP Contract course?²	Yes
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark	Benchmarked against QAA Master's Benchmark Statements for

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Statement(s)	Computing
Registration Period(s) available	A student who registers for the PgCert will have a registration period of 3 years. For the PgDip this will be 4 years, and for the MSc 5 years. A Full time student will have a registration period of 1 year.
Course Start Month(s)	Full-time & Part-time – September Part-time - January

Institutions delivering the course

This course is delivered by Cranfield Defence and Security, Centre of Cyber Security and Information Systems where the research interests include:

Information Management, Human Factors, Enterprise Architecture and Information Systems (IS)

Cranfield University interacts with the following institutions and in the following ways:

The course has no academic or industrial partners. Students will probably undertake their research for the dissertation stage through another organisation (often their sponsor).

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

The course is accredited formally by the British Computer Society (BCS) up to and including the 2021 intake. Successful completion of the MSc can lead to Chartered Professional Status. The course is also accredited by the Chartered Institute of Library and Information Professionals (CILIP).

2. What are the aims of the course?

Cranfield University offers this course in order:

- to provide students with a broad base of information system (IS) and management theories, concepts, applications and techniques in order to contribute to IS provision in support of an organisation's business goals
- to develop or enhance professional competence and agility in individuals who wish to become senior managers who can master the disciplines of both business and information.
- to develop students' ability through comprehensive analysis and synthesis of key issues and specific areas of interest that will enable them to be effective within the IS profession
- to provide students with a knowledge of information systems, management theories and enabling technologies along with the skills to critically analyse their practical application in order to support business goals.
- to develop the skills to work with others in a team based environment.
- to enable optimum effectiveness through conceptualisation, abstraction, and evaluation of complex often competing requirements, constraints and imperatives from a variety of stakeholders in order to exercise informed professional IS judgement.

Additional MSc Aims

- to enhance and synthesise independent learning abilities.

- to apply critical appraisal skills to research and analyse a relevant information system issue, challenge or opportunity in an evidence based dissertation.

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) entry routes are provided for students who wish to access only parts of the Course provided. This programme is intended for the following range of students:

- personnel from the Ministry of Defence
- personnel from Government bodies
- employees from industry
- people wishing to develop the skills and knowledge associated with development of business systems.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate/Postgraduate Diploma

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. analyse the conceptualisation of the information systems environment in the UK specifically and more generally in a global context
- ILO 2. compare contemporary IS methodology and their applicability to the development of strategy and systems
- ILO 3. distinguish the nature and impact of project management on the effective delivery and operation of information systems
- ILO 4. outline contemporary emerging technology and illustrate its application to a range of scenarios
- ILO 5. critically evaluate requirements within selected business environments (including legal, ethical) in order to best support business process with information systems
- ILO 6. demonstrate synthesis and evaluation in the consideration of key approaches to strategic information system development
- ILO 7. develop representational models of information system processes and apply them within the strategic information system development environment
- ILO 8. critically analyse information from disparate sources synthesising unique interpretation
- ILO 9. demonstrate the ability to work within teams, communicating and collaborating in order to develop solutions to information systems challenges

- ILO 10. utilise value judgement to act as an informed customer in information system discussions
- ILO 11. apply relevant theories, concepts and techniques in the development of information systems in an integrated team based environment
- ILO 12. critically analyse risk and uncertainty, undertaking alleviation action (including system protection and security) in order to achieve cost effective and timely performance
- ILO 13. develop and prioritise strategies and approaches that develop and enhance effective information systems
- ILO 14. evaluate influences, and apply concepts and techniques in the production of strategy and development of information systems

B. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 15. undertake analytical research, using appropriate research methodology, data collection and analysis into defined areas to produce evidence based meaningful and applicable recommendations for action to enhance information system development
- ILO 16. exercise self-direction, independent learning abilities and originality of thought in optimising, evaluating and presenting information system development recommendations and solutions

4. How is the course taught?

Students will be supported in their learning and personal development by:

- dedicated study skills sessions in the Foundations module
- access to materials on the Virtual Learning Environment (VLE) that support study skills development
- case studies that translate the theories into practical solutions
- lectures from subject matter experts both internal and external to the University
- visits to relevant organisations
- group-work involving investigation into a current subject area and presentation to peers
- access to a range of material through the University Library services

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Foundations of IS	10
ELECTIVE MODULES:	
5 modules chosen from 2-12	50
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-12	120
ELECTIVE MODULES:	
N/A	
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1–12	120
Module 13 (Research Project)	80
ELECTIVE MODULES:	
N/A	
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);^{3 4}
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 48 weeks. Full-time modules run in three week blocks with a week of directed study prior to a taught week and another directed study period after the taught week to allow time for more independent learning, reflection and completion of coursework. Two modules are run via the VLE over a period of approximately 14 weeks supported by face to face tutorials.

Part-time students have up to five years to complete the twelve modules and dissertation (on average four modules per year) but could complete in less than three years depending on student availability to study. Modules are taken with the full time students during the full-time delivery and via the virtual learning environment (VLE). Part time students typically complete each module over

³ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

a seven week period (sharing the same taught week with the full-time students but with six weeks of directed study; 3 weeks of directed study before the taught week and 3 weeks afterwards to allow time for more independent learning, reflection and completion of coursework).

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar				Assessment					
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹
1	R-SISD-F	Foundations of IS (A) Foundations of IS (B)	Ross Harris	30		10	N		03/09/18 14/01/19	07/09/18 18/01/19	40	ICW	100			17/09/18 FT 01/10/18 PT 11/02/19 PT(B)	17/12/18 AY19/20

+ Distance learning module

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis; MULTI – Multi-part assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar				Assessment						
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
2	R-SISD-PI	Professional Issues+	Nikki Williams	10		10	N	03/09/18	03/09/18	17/12/18	40	ICW	100				17/12/18 FT/PT	AY19/20
3	R-SISD-PM	Programme and Project Management for Information Systems	Annie Maddison-Warren	30		10	N	15/10/18 (PT) 29/10/18 (FT)	05/11/18	09/11/18	40	ICW	100				19/11/18 FT 03/12/18 PT	AY19/20
4	R-SISD-MT	Methods and Tools for Information Systems Development	Ian Owens	30		10	N	03/09/18 (PT) 17/09/18 (FT)	24/09/18	28/09/18	40 40	GPRES ICW	25 75				28/09/18 FT/PT 08/10/18 FT 22/10/18 PT	AY19/20
5	R-SISD-SE	Software Engineering	Paul Yoo	30		10	N	24/09/18 (PT) 08/10/18 (FT)	15/10/18	19/10/18	40 40	GCW ICW	25 75				19/10/18 FT/PT 29/10/18 FT 12/11/18 PT	AY19/20

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis; MULTI – Multi-part assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar				Assessment						
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
6	R-SISD-ISA	Systems Architecture	Rick Adcock	30		10	N	05/11/18 (PT) 19/11/18 (FT)	26/11/18	30/11/18	40 40	GCW ICW	25 75				30/11/18 FT/PT 10/12/18 FT 07/01/19 PT	AY19/20
7	R-SISD-SAIS	Digital Business Strategy	Ross Harris/ Ian Owens	30		10	N	07/01/19 (PT) 21/01/19 (FT)	28/01/19	01/02/19	40 40	GCW ICW	25 75				01/02/19 FT/PT 11/02/19 FT 25/02/19 PT	AY19/20
8	R-SISD-ETM	Emerging Technology Monitoring+	Ian Owens	7		10	Y	07/01/19	12/02/19 Compulsory one day	13/05/19	40	ICW	100				13/05/19 FT 13/05/19 PT	AY19/20
9	R-SISD-OD	Organisational Development	Rebecca McKeown	30		10	N	28/01/19 (PT) 11/02/19 (FT)	18/02/19	22/02/19	40	ICW	100				04/03/19 FT 18/03/19 PT	AY19/20
10	R-SISD-IAS	Cyber Security & Information Assurance	Darren Lawrence	30		10	Y	18/02/19 (PT) 04/03/19 (FT)	11/03/19	15/03/19	40 40	GCW ICW	25 75				15/03/19 FT/PT 25/03/19 FT 08/04/19 PT	AY19/20

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis; MULTI – Multi-part assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar				Assessment						
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
11	R-SISD-DMSM	Data Modelling, Storage and Management	Duncan Hodges	30		10	N	11/03/19 (PT) 25/03/19 (FT)	01/04/19	05/04/19	40	GCW	25				05/04/19 PT/FT 15/04/19 FT 29/04/19 PT	AY19/20
12	R-SISD-DLDS	Data-led Decision Support	Duncan Hodges	30		10	Y	01/04/19 (PT) 15/04/19 (FT)	23/04/19	26/04/19	40	GCW	25				26/04/19 PT/FT 06/05/19 FT 20/05/19 PT	AY19/20
13	R-SISD-DISS	Dissertation ¹²	Antoinette Caird-Daley	24		80	N	Workshop: A 20/05/19 B 28/09/18 C 31/01/19 D 29/03/19 E 31/07/19	10/12/18 24/06/19	12/12/18 26/06/19	50	Thesis	100				A 26/07/19 FT B 30/09/19 PT C 31/01/20 PT D 31/03/20 PT E 31/07/20 PT	

¹² Occurrence A is for Full time students. Occurrences B -E are for Part-time students who have completed the taught phase of the Course; Occurrence chosen is to be agreed in consultation with Course Director

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis; MULTI – Multi-part assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
R-SISD-DLDS	Data Led Decision Support	ICM MSC	Defence Cyber Masters Programme
R-SISD-IAS	Cyber Security & Information Assurance	ICM MSC	Forensics Investigation MSC
R-SISD-ETM	Emerging Technology Monitoring	ICM MSC	Defence Cyber Masters Programme

7. How are the ILOs assessed?

The Course uses a range of assessment types. Depending on the number and type of modules taken students can expect assessment by submitted work and elements of assessment by presentation or viva. Some of this assessed work will be completed in groups. For each module students will be invited to undertake one or more pieces of coursework which collectively will form a portfolio of work to be assessed.

This approach has been adopted in order to present students with a variety of realistic problems that need to be solved using a variety of approaches which provide opportunities to demonstrate their ability to apply skills and knowledge developed on the course, many of which relate to situations that might be found in the workplace. To obtain an MSc, students must complete a dissertation, demonstrating their ability to apply the skills and knowledge gained on the course to a real world problem.

Assessment and ILO Mapping

A. Postgraduate Certificate/Diploma

Award ILOs Module No.	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7	ILO8	ILO9	ILO10	ILO11	ILO12	ILO13	ILO14	ILO15	ILO16
1	ICW							ICW								
2	ICW				ICW									ICW		
3		ICW	ICW		ICW		ICW		ICW		ICW					ICW
4	ICW	ICW			ICW			ICW	ICW		ICW		ICW	ICW	ICW	ICW
5		GCW/ ICW			GCW	GCW/ ICW	ICW		GCW		ICW					
6	ICW	ICW, GCW			ICW, GCW	ICW, GCW		ICW	GCW	ICW	GCW	ICW	GCW	GCW	ICW	ICW
7	GCW	ICW				ICW/ GCW		ICW/ GCW	GCW	GCW	GCW	GCW	ICW	GCW		
8				ICW												

Award ILOs Module No.	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7	ILO8	ILO9	ILO10	ILO11	ILO12	ILO13	ILO14	ILO15	ILO16
9		ICW							ICW		ICW				ICW	
10								ICW	GCW			ICW				
11					ICW, GCW		ICW	ICW, GCW	GCW	ICW, GCW	GCW	ICW, GCW			ICW	ICW
12				GCW		GCW		GCW/ ICW	GCW		GCW		ICW	ICW		

B. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO15	ILO16
13	THESIS	THESIS

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the expectations and indicators of sound practice of the QAA Quality Code Chapter B10: Managing Higher Education Provision with Others, with regards to the management and operation of the partnership and that the academic standards and the quality of the student experience are assured in line with the remaining chapters of the QAA Quality Code. The delivery of new partnership provision is ultimately approved by the University's Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

9. What opportunities are graduates likely to have on completing the course?

On successful completion of the course the student will have a Masters' Degree in Information Capability Management accredited by two professional bodies, recognised by Government and industry, representing Information Professionals (CILIP) and IT Professionals (BCS).

The course will take students on to further senior management career opportunities with skills in appropriate areas including business strategy development and implementation, information management, information assurance/ cyber security, development of appropriate business systems and strategic application of information systems.

COURSE SPECIFICATION



Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in International Defence and Security

Date of first publication/latest revision: March 2018

1. What is the course?

Course information

Course Title	International Defence and Security
Course code	MSIDSFTR, PDIDSFTR, PCIDSFTR
Academic Year	2018-19
Valid entry routes	MSc, PgDip, PgCert
Additional Exit routes	PgDip, PgCert
Mode of delivery	Full Time
Location(s)¹ of Study	Shrivenham
School(s)	Cranfield Defence and Security
Theme	Defence and Security
Centre	Centre for International Security and Resilience
Course Director	Mr David Turns
Awarding Body	Cranfield University
Is this an AP Contract course?²	NO
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements.
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc - one year, Full-time PgCert - one year, Full-time PgDip - one year

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Course Start Month(s)	September
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Institutions delivering the course

This course is delivered by the Centre for International Security and Resilience where the research interests include international relations, civil-military relations, international law, military history, government and politics, terrorism, global and regional security, and resilience.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies.

2. What are the aims of the course?

Cranfield University offers this course in order to enhance students' knowledge, professional understanding and analytical skills necessary to improve and/or transform the governance and management of defence and security systems.

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) exit routes are provided for students who wish to access only parts of the course provided.

This programme is intended for the following range of students:

- Serving members of the UK MoD (civilian and military)
- Foreign MoD civil servants and members of foreign armed forces
- Staff from other UK and foreign government departments, as well as international governmental and non-governmental organisations, who have an identified need to develop their knowledge of defence and security
- Civilians with an interest in defence and security

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Analyse, evaluate and critique current research on defence and security
- ILO 2. Compare and contrast different countries' approaches to ensuring defence and security
- ILO 3. Determine what is a 'security' issue and on what basis, and recognise the differences and similarities between the main security studies disciplines and integrate them into an analysis of security problems
- ILO 4. Evaluate the principal defence and security structures, agreements, alliances and methods of governance and management in place around the world
- ILO 5. Critique international relations theory and apply it to an analysis of security

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 6. Critique current thinking and evaluate, analyse and make policy recommendations relevant to international defence and security
- ILO 7. Critically analyse information from disparate sources so as to inform solutions to challenges and problems
- ILO 8. Evaluate and appraise conflicting interpretations and solutions to security issues
- ILO 9. Work individually and within teams so as to evolve robust recommendations in respect of defence and security issues
- ILO 10. Brief audiences on issues in all of the above fields, and make policy recommendations using an appropriate mix of words, graphics and visual images

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 11. Analyse a selected defence or security issue/problem so as to develop an authoritative and in-depth knowledge that will have wider application and utility
- ILO 12. Devise, scope and plan a research project
- ILO 13. Develop and hone the individual research, information, communication and referencing skills to produce a high quality, evidence-based dissertation of 20,000 words suitable for publication within a defined period

4. How is the course taught?

Students will be supported in their learning and personal development by:

- undertaking exercises relevant to the specific area of defence or security being studied
- facilitated group discussions
- engaging in debates
- presentations from visiting speakers who will be subject matter experts
- official visits to Defence or Security HQs where appropriate
- attending relevant elements of Cranfield Symposia

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
C1 Study Skills and Research Methodology	10
C2 Issues in International Security, Conflict and Development	20
C3 Defence in the 21st Century	20
ELECTIVE MODULES:	
1 elective module chosen from E1 – E17	10
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
C1 Study Skills and Research Methodology	10
C2 Issues in International Security, Conflict and Development	20
C3 Defence in the 21st Century	20
ELECTIVE MODULES:	
7 elective modules chosen from E1 – E17	70
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
C1 Study Skills and Research Methodology	10
C2 Issues in International Security, Conflict and Development	20
C3 Defence in the 21st Century	20
Dissertation	80
ELECTIVE MODULES:	
7 elective modules chosen from E1 - E17	70
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);^{3 4}
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 48 weeks.

MSc students need to complete 3 compulsory modules, 7 electives and a Dissertation. PgDip students need to complete 3 compulsory modules and 7 electives. PgCert students need to complete 3 compulsory modules and 1 elective.

³ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
C1	R-IDS-SSRM	Study Skills and Research Methodology	Mrs Edith Wilkinson	30	0	10	N	03/09/18	03/09/18 26/11/18	14/09/18 30/11/18	40			100 MULTI	ICW IPRES	60% 40%	01/11/18 07/12/18	03/01/19 08/02/19
C2	R-IDS-IISCD	Issues in International Security, Conflict and Development	Dr Gemma Collantes-Celador	60	0	20	N	17/09/18	17/09/18	02/11/18	40 40	CW EX	50 50				12/11/18 11/12/18	14/01/19 11/03/19

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi part

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
C3	R-IDS-D21C	Defence in the 21st Century	Dr Laura Cleary	60	10	20	N	17/09/18	17/09/18	02/11/18	40 40	ICW EX	50 50				12/11/18 14/12/18	14/01/19 15/03/19
E1	R-IDS-DCR	Diplomacy and Conflict Resolution	Dr Anastasia Filippidou	30	0	10	N	05/11/18	05/11/18	23/11/18	40 40	ICW IPRES	70 30				03/12/18 23/11/18	29/01/19 TBC
E2	R-IDS-MDWS C	Managing Defence in the Wider Security Context	Dr Laura Cleary	30	0	10	N	07/01/19	07/01/19	25/01/19	40			100	ICW IPRES	80 20	04/02/19 25/01/19	08/04/19 TBC
E3	R-IDS-ILAC	International Law and Armed Conflict	Mr David Turns	30	4	10	N	18/02/19	18/02/19	08/03/19	40 40	ICW EX	60 40				18/03/19 08/04/19	20/05/19 10/06/19
E4	R-IDS-ICLHR	International Criminal Law and Human Rights	Mr David Turns	30	4	10	N	NOT RUNNING IN 2018-19			40 40	ICW EX	60 40					
E5	R-IDS-AMFC MW	Intelligence in International Security		30	0	10	N	NOT RUNNING IN 2018-19			40 40	ICW EX	60 40					
E6	R-IDS-TCT	Counter-Terrorism and Intelligence	Dr Anastasia Filippidou	30	0	10	N	28/01/19	28/01/19	15/02/19	40 40	ICW IPRES	70 30				25/02/19 15/02/19	29/04/19 TBC

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi part

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar				Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
E7	R-IDS-RS	Regional Security	Dr Anicee Van Engeland	30	0	10	N	07/01/19	07/01/19	25/01/19	40	ICW	100				04/02/19	08/04/19	
E8	R-IDS-IIPS	International Interventions for Peace and Statebuilding	Dr Gemma Collantes-Celador	30	0	10	N	05/11/18	05/11/18	23/11/18	40	ICW	100				03/12/18	29/01/19	
E9	R-IDS-MND	Managing Natural Disasters		30	0	10	N	NOT RUNNING IN 2018-19				40	ICW	100					
E10	R-IDS-WMDC V	Weapons of Mass Destruction, Control and Verification		30	8	10	N	NOT RUNNING IN 2018-19				40	ICW	100					
E11	R-IDS-MSD	Military Support to Disasters		30	0	10	N	NOT RUNNING IN 2018-19				40 40			100 MULTI	ICW ICW	60 40		
E12	R-IDS-CM	Crisis Management		30	5	10	N	NOT RUNNING IN 2018-19				40	ICW	100					
E13	R-RES-RC	Resilience	Mrs Edith Wilkinson	30	0	10	N	NOT RUNNING IN 2018-19				40	ICW	100					

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi part

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
E14	R-IDS-RR	Risk, Crisis and Resilience	Mrs Edith Wilkinson	30	0	10	N	18/03/19	18/03/19	05/04/19	40	ICW	100				15/04/19	17/06/19
E15	R-IDS-FMC	Future Military Conflicts and Support to Disasters	Dr Anna Maria Brudenell	30	N/A	10	N	NOT RUNNING IN 2018-19			40	ICW	100					
E16	R-IDS-SFDA MW	Strategic Frameworks and Decision-making in the Ancient and Modern Worlds	Dr Anastasia Filippidou	30		10		18/02/19	18/02/19	08/03/19	40	ICW IPRES	60 40				18/03/19 08/03/19	20/05/19 TBC
E17	R-IDS-GVA C	Gender, Violence and Armed Conflicts	Dr Anicee Van Engeland	30		10		18/03/19	18/03/19	05/04/19	40	ICW IPRAC	50 50				15/04/19 15/04/19	17/06/19 17/06/19
D1	R-IDS-DISS	Dissertation	Mr David Turns	30	N/A	80	N	10/06/19	10/06//19	16/08/19	50	THESIS	100				16/08/19	Examiners Discretion

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi part

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

7. How are the ILOs assessed?

Each module in the taught phase may be assessed by a written examination, coursework assignment or a combination of both. Where a module is assessed by a combination of examination and coursework, then the marks for that module are apportioned as appropriate.

Some modules may be assessed entirely by coursework and in such cases the coursework accounts for 100% of the marks for that module. The taught phase in total contributes to 60% of the overall final assessment, while the dissertation phase contributes to 40% of that overall final assessment.

Where an assessment is the product of a group effort, to ensure that individual students' efforts and contributions are fairly and accurately recognised, coursework submissions must clearly highlight how the individual responsibilities were sub-divided and each page of the submission must be clearly marked with the student's name indicating his/her contribution.

The student must satisfy the Examiners in all elements of the course.

This approach has been adopted because:

It provides for a suitable variety of assessment methodologies and formats appropriate to the level of studies and the subject-matter and discipline.

Assessment and ILO Mapping

A. Postgraduate Certificate

Award ILOs Module No.	ILO1	ILO2	ILO3	ILO4	ILO5
C2	ICW/EX		ICW/EX	ICW/EX	ICW/EX
C3	ICW/EX	ICW/EX	ICW/EX	ICW/EX	

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO6	ILO7	ILO8	ILO9	ILO10
E1	ICW/IPRES	ICW/IPRES	ICW/IPRES	ICW/IPRES	ICW/IPRES

Award ILOs Module No.	ILO6	ILO7	ILO8	ILO9	ILO10
E2	ICW	ICW	ICW	ICW	
E3	ICW/EX	ICW/EX	ICW/EX	ICW/EX	
E4	ICW/EX	ICW/EX	ICW/EX	ICW/EX	
E5	ICW/EX	ICW/EX	ICW/EX	ICW/EX	
E6	ICW/IPRES	ICW/IPRES	ICW/IPRES	ICW/IPRES	ICW/IPRES
E7	ICW	ICW	ICW	ICW	
E8	ICW	ICW	ICW	ICW	
E9	ICW	ICW	ICW	ICW	
E10	ICW	ICW	ICW	ICW	
E11	ICW1/ICW2	ICW1/ICW2	ICW1/ICW2	ICW1/ICW2	
E12	ICW	ICW	ICW	ICW	
E13	ICW	ICW	ICW	ICW	
E14	ICW	ICW	ICW	ICW	
E15	ICW	ICW	ICW	ICW	
E16	ICW/IPRES	ICW/IPRES	ICW/IPRES	ICW/IPRES	ICW/IPRES
E17	ICW/IPRAC	ICW/IPRAC	ICW/IPRAC	ICW/IPRAC	

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	xi	xii	xiii
C1		ICW	
D1	THESIS	THESIS	THESIS

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at

least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the expectations and indicators of sound practice of the QAA Quality Code Chapter B10: Managing Higher Education Provision with Others, with regards to the management and

operation of the partnership and that the academic standards and the quality of the student experience are assured in line with the remaining chapters of the QAA Quality Code. The delivery of new partnership provision is ultimately approved by the University's Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

9. What opportunities are graduates likely to have on completing the course?

This course is intended to attract students who are either currently employed in posts relating to Security Cooperation (Defence Attachés, Desk Officers within Ministries of Defence, representatives from the FCO and DfID), members of the Armed Forces or those individuals who generally have an interest in issues pertaining to defence and security. Students may also wish to pursue careers with private security companies, think tanks, within academia or for foreign governments or international governmental or non-governmental organisations.

Applicants to this degree come from a range of backgrounds. While we have a number of candidates who have recently completed their undergraduate degrees, we also have a significant number who are civil servants working within defence, serving and retired military personnel and those who work within the financial services. The aim of this course is therefore to provide all students with a high quality, and transferable, postgraduate qualification.

COURSE SPECIFICATION



Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Investment Management

Date of first publication/latest revision: May 2018

1. What is the course?

Course information

Course Title	MSc in Investment Management
Course code	MSIVMFTC, PDIVMFTC, PCIVMFTC
Academic Year	2018/19
Valid entry routes	MSc
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time
Location(s)¹ of Study	Cranfield Campus
School(s)	School of Management
Theme	Leadership and Management
Centre	Policy, Sustainability and Performance
Course Director	Dr Vineet Agarwal
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc – one year
Course Start Month(s)	September

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Institutions delivering the course

This course will primarily be delivered by Finance and Accounting group in School of Management. The course shares 80 credits on the core modules and 15 credits via three electives with the existing MSc Finance and Management programme but will provide a more quantitative and specialist pathway, with 20 credits of specialism in the core modules and potentially additional 20 credits via five electives different from those offered on current MSc in Finance and Management programme.

Cranfield University interacts with the following institutions and in the following ways:

- Teaching/instruction from external academic, industry and other guest speakers.
- Individual thesis or company based project.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not formally accredited by any external bodies.

2. What are the aims of the course?

Cranfield University offers this course in order to provide students with an advanced-level conceptual foundation in various functional dimensions of the complex world of investment management. It will impart better understanding of investment issues and develop the necessary skills and knowledge in line with the requirements of the investment industry within the UK and worldwide.

The objectives are six-fold:

1. To prepare students for the world of employment in investment management through a high quality teaching of specialised modules that will focus on developing a strong understanding of theory and its application in practice.
2. To provide a rich student learning experience through hands on teaching techniques that will utilise the application of data analysis using Bloomberg.
3. To enrich student learning experience by offering an opportunity to do independent research linking this through company based projects.
4. To impart advance study and understanding of the investment sector and the changing external context in which it operates.
5. To develop a range of finance knowledge and skills, together with self-awareness and personal development appropriate for successful career in the investment industry.
6. To enhance lifelong learning through the development of transferable intellectual and study skills to enable self-direction and creativity, in order to contribute to business, the economy and society at large.

The proposed programme will be equally attractive to new graduates and those looking to develop a career in the investment industry such as investment specialists, traders, fund managers, risk managers, analysts and brokers.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

Version 1.0 June 2018

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Be able to appraise key investment and management issues.
- ILO 2. Be able to interpret and apply accounting and financial information effectively.
- ILO 3. Originality in the application of firm valuation and application of financial modeling for practical decision making.
- ILO 4. Apply key investment management skills required for decision making.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 5. Be able to critically assess current research in finance and investment together with the capacity to evaluate its relevance to practice.
- ILO 6. A conceptual understanding that enables the student to evaluate contemporary issues and methods for financial analysis and, where appropriate, adapt them in the context of both advanced scholarship and their selected elective subjects.
- ILO 7. Be able to acquire and use information effectively in any appropriate medium, including the increasing range of analytical tools for investment decision making.
- ILO 8. Be able to advance their knowledge and develop new financial and management skills to a high level.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 9. Be confidently able to apply investment management theories, tools and techniques in a variety of contexts including case studies, trading simulations and the individual thesis project.
- ILO 10. Evaluate appropriate theoretical frameworks for an issue or situation under consideration and to apply the technique(s) correctly.
- ILO 11. Display practical capabilities in self-directed research, data gathering, data analysis and interpretation, report writing and presentation skills.
- ILO 12. Carry out research using appropriate techniques and draw justifiable inferences from the data obtained.
- ILO 13. Critically evaluate and synthesis the published literature in finance and investment.
- ILO 14. Produce a high quality thesis and critically evaluate the interpretations of the data.

4. How is the course taught?

Overall the aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills. The course will be supported by an electronic learning environment (VLE - Blackboard) which will be the central repository for all information relating to the course and available to the students at all times. This will be supplemented by online module case packs. Additional practical expertise will be provided by visiting fellows and guest speakers. Each core module comprises 20 hours of class contact time with a further 80 hours of study time to consolidate learning and carry out assignments, giving 100 notional learning hours per module. Each elective module has 50 notional hours consisting of 15 class contact hours and a further 35 private study hours. The thesis component of the module is a total of 80 credits.

The teaching methods, as laid out in section 2, include:

- Lectures
- Student centred learning/reflection
- Exercises/Case studies

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- Trading Simulations
- Individual company based research project/thesis supported by academic supervision

In addition to the teaching methods outlined above, students are supported in their learning and personal development by:

- Personal development lectures delivered by the head of the careers development service
- Help with preparation of CVs
- Help through mock interviews

The MSc in Investment Management will be differentiated from our existing Finance and Management MSc by:

- By targeting students with strong quantitative skills looking for careers in investment industry
- By offering a number of new and unique electives with a global perspective
- By making suitable changes to the existing Finance and Management programme contents and making it more corporate finance oriented MSc
- By orientating career development towards investment industry

Students will be supported in their learning and personal development by:

- Two week orientation program in accounting, finance and statistics aimed at students with quantitative background but have little or no prior background in accounting and finance and statistics
- Library induction, referencing and plagiarism sessions
- PDP specifically supported through SOM careers development sessions
- Organisation Behaviour and Personal Development module
- A Virtual Learning Environment
- Learning teams supported by an academic tutor
- Provision of language classes. Mandatory for those with only one language and optional for those with more

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. **Postgraduate Certificate**

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
6 modules from 1-10 including 20 credits from modules 7, 8 or 9	60
ELECTIVE MODULES:	
N/A	N/A
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-10	100
ELECTIVE MODULES:	
4 modules must be taken from 8 optional modules 11-21	20
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-10	100
Thesis 22	80
ELECTIVE MODULES:	
4 modules must be taken from 8 optional modules 11-21	20
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);^{3 4}

³ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

The course will be offered on a full-time basis only. Full-time students register for the course in September and are expected to complete the course within 12 calendar months.

The core modules will be taught in a series of 10x2 hour lectures in the first two terms. The elective modules will be taught in 6x2 and 1x3 hours lectures in the third term. The individual company based project/thesis is undertaken during terms 3 and 4.

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar				Assessment					
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹
TERM 1																	
1	M-F/COF	Corporate Finance	Dr Yacine Belghitar	20		10	Y		1/01/2018	6/11/2018	40	EX	100			10/12/2018	TBC
2	M-F/SAF	Statistical Analysis in Finance	Nemanja Radic	20		10	Y		4/10/18	27/11/18	40 40	GCW EX	40 60			20/12/2018 11/12/2018	TBC
3	M-F/ACC	Accounting	Dr Matthias Nnadi	20	6	10	Y		3/10/18	28/11/18	40 40	EX EX	25 75			13/11/2018 12/12/2018	TBC
4	M-F/ECO	Economics for Financial Markets	Dr Constantinos Alexiou	20		10	Y		1/10/18	27/11/18	40	EX	100			8/01/2019	TBC

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
5	M-F/ORG	Organisational Management	Valentina Battista	20		10	Y		2/10/18	27/11/18	40	ICW	100				18/12/2018	TBC
TERM 2																		
6	M-F/VFM	Valuation and Financial Modelling	Dr Vineet Agarwal	20		10	Y		07/01/2019	06/02/2019	40 40	GCW EX	50 50				15/03/2019	TBC
7	M-F/FMRE	Financial Markets, Regulation and Ethics	Walt Gontarek	20	14 / 6	10	Y		09/01/2019	27/02/2019	40 40	IPRAC	70	Multi 30	GPRES GPRES	15 15	29/01/19 26/02/19 27/02/19	TBC
8	M-I/IPM	Investment and Portfolio Management	Prof Sunil Poshakwale/ Dr Peter Yallup	20		10	N		7/01/2019	06/02/2019	40	EX	100				15/03/2019	TBC
9	M-I/DFR	Derivatives and Financial Risk Management	Dr Peter Yallup	20		10	N		9/01/2019	27/02/2019	40	EX	100				15/03/2019	TBC
10	M-F/RMF	Research Methods in Finance	Dr Vineet Agarwal	20		10	Y		5/02/2019	6/03/2019	40 40	GPRES ICW	30 70				15/03/2019	TBC
TERM 3																		
11	M-F/FEC	Applied Financial Econometrics	Dr Yacine Belghitar, Dr Peter Yallup	15		5	Y		09/4/19	8/5/2019	40	ICW	100				21/6/2019	TBC
12	M-F/BDM	Bigdata Management and Cybersecurity	Andrea Moro	15		5	Y		11/04/2019	21/06/2019	40	ICW	100				21/6/2019	TBC

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Presentation
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Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar				Assessment						
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
13	M-F/BSC	Blockchain, Cryptocurrencies, and Small Contracts	Dr Andrea Moro	15		5	Y		11/4/19	02/05/2019	40	ICW	100				21/6/2019	TBC
14	M-I/FNM	Fund Management	Jane Vessey	15		5	Y		11/04/2019	21/06/2019	40	EX	100				21/6/2019	TBC
15	M-F/MAD	Mergers and Acquisitions	Dr Andrea Moro	15		5	Y		10/4/19	26/5/2019	40	ICW	100				21/6/2019	TBC
16	M-I/FIS	Fixed Interest Securities	Dr Vineet Agarwal	15		5	Y		17/4/19	01/5/2019	40	EX	100				21/6/2019	TBC
17	M-F/PEQ	Private Equity	Nemanja Radic	15		5	Y		09/04/2019	15/05/2019	40	ICW	100				21/6/2019	TBC
18	M-I/TATS	Technical Analysis and Trading Systems	Dr Peter Yallup	15		5	Y		09/4/19	08/5/2019	40 40	ICW GCW	50 50				21/6/2019	TBC
19	M-I/IEM	International Investment and Emerging Markets	Prof Sunil Poshakwale	15		5	Y		10/4/19	02/5/2019	40			100 MULTI	IPRES ICW	25 75	21/6/2019	TBC
20	M-F/CRS	Corporate Restructuring	Dr Yacine Belghitar	15		5	Y		13/04/19	09/05/19	40	ICW	100				21/6/2019	TBC
21	M-F/IFF	Infrastructure Finance	Ian Alexander	15		5	Y		11/4/19	02/5/2019	40	EX	100				21/6/2019	TBC
22	M-F/ENF	Entrepreneurial Finance	Dr Andrea Moro	15		5	Y		11/4/19	16/5/2019	40	ICW	100				21/6/2019	TBC

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPAC – Group Practical
Version 1.0 June 2018

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar				Assessment						
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
23	M-F/SMA	Strategic Management Accounting and Control	Prof Michael Bourne	15		5	Y		10/4/19	16/6/2019	40	ICW	100				21/6/2019	TBC
TERM 4																		
24	M-F/THS	Thesis	Dr Andrea Moro	50		80	Y		25/6/19	6/9/19		THESIS	100				6/9.2019	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group **Version 1.0 June 2018**

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
M-F/COF	Corporate Finance	Finance and Management	Finance and Management
M-F/SAF	Statistical Analysis in Finance	Finance and Management	Finance and Management
M-F/ACC	Accounting	Finance and Management	Finance and Management
M-F/ECO	Economics for Financial Markets	Finance and Management	Finance and Management
M-F/ORG	Organisational Management	Finance and Management	Finance and Management
M-F/VFM	Valuation and Financial Modelling	Finance and Management	Finance and Management
M-F/FMRE	Financial Markets, Regulation and Ethics	Finance and Management	Investment Management Retail and Digital Banking
M-F/RMF	Research Methods in Finance	Finance and Management	Finance and Management
M-F/MAD	Mergers and Acquisitions	Finance and Management	Finance and Management
M-F/BCS	Blockchain, Cryptocurrencies, and Smart Contracts	Finance and Management	Investment Management
M-F/FEC	Applied Financial Econometrics	Finance and Management	Finance and Management
M-F/BDM	Bigdata Management and Cybersecurity	Finance and Management	Finance and Management
M-F/PEQ	Private Equity	Finance and Management	Finance and Management
M-I/FNM	Fund Management	Investment Management	Finance and Management
M-I/FIS	Fixed Income Securities	Investment Management	Finance and Management
M-I/TATS	Technical Analysis and Trading Systems	Investment Management	Finance and Management
M-I/IEM	International Investment and Emerging Markets	Investment Management	Finance and Management
M-F/CRS	Corporate Restructuring	Finance and Management	Finance and Management
M-F/IFF	Infrastructure Finance	Finance and Management	Finance and Management
M-F/ENF	Entrepreneurial Finance	Finance and Management	Finance and Management
M-F/SMA	Strategic Management Accounting and Control	Finance and Management	Finance and Management
M-F/THS	Thesis	Finance and Management	Finance and Management

7. How are the ILOs assessed?

The following assessment types are utilised:

This is a full-time course with 10 credits (100 notional learning hours) per core module and 5 credits (50 notional learning hours) per elective module taken over 11 months comprising 200 credits in total. It will be assessed by conventional means: exams, group and individual assignments and an 80 credit company based project / thesis at the end of the programme.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

Award ILOs Module No.	Postgraduate Certificate				Postgraduate Diploma				MSc					
	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7	ILO8	ILO9	ILO10	ILO11	ILO12	ILO13	ILO14
1	✓	✓	✓	✓										
2			✓	✓										
3		✓		✓										
4	✓			✓										
5	✓			✓										
6	✓	✓	✓	✓		✓	✓	✓						
7	✓			✓										
8	✓	✓		✓										
9	✓	✓		✓										
10	✓	✓		✓										
11							✓	✓						
12					✓		✓	✓						
13				✓	✓		✓	✓						
14				✓	✓		✓	✓						
15					✓	✓	✓	✓						
16						✓	✓	✓						
17					✓	✓		✓						
18					✓		✓	✓						
19					✓		✓	✓						
20					✓	✓	✓	✓						
21					✓	✓		✓						
22					✓	✓	✓	✓						
23					✓		✓	✓						
24									✓	✓	✓	✓	✓	✓

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
N/A	N/A	N/A	N/A
		N/A	N/A

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of

professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the expectations and indicators of sound practice of the QAA Quality Code Chapter B10: Managing Higher Education Provision with Others, with regards to the management and operation of the partnership and that the academic standards and the quality of the

student experience are assured in line with the remaining chapters of the QAA Quality Code. The delivery of new partnership provision is ultimately approved by the University's Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

9. What opportunities are graduates likely to have on completing the course?

Investment management is one of the fastest growing industries and the potential for recruitment is very promising. The rapid growth and developmental needs of investment expertise, especially in emerging countries, will demand people with necessary knowledge and skills. Therefore, our graduates can expect to work in top investment banks, hedge funds, major consulting firms and other financial and banking sectors around the world.

COURSE SPECIFICATION



Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Land Reclamation and Restoration

Date of first publication/latest revision: 06/03/18

1. What is the course?

Course information

Course Title	Land Reclamation and Restoration
Course code	MSLREFTC, MSLREPTC, PDLREFTC, PDLREPTC, PCLREFTC, PCLREPTC
Academic Year	2018/19
Valid entry routes	MSc, PgDip, PgCert
Additional Exit routes	PgDip, PgCert
Mode of delivery	Full-time, Part-time
Location(s)¹ of Study	Cranfield
School(s)	School of Water, Energy and Environment
Theme	Environment & Agrifood
Centre	Cranfield Soil and Agrifood Institute (CSAFI)
Course Director	Dr Ruben Sakrabani
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	1st or 2nd class UK honours degree or equivalent; in a science or engineering subject; Candidates with other qualifications will be considered according to experience Where applicable minimum IELTS score of 6.5 or TOEFL 580
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc - one year, Full-time PgCert - one year, Full-time PgDip - one year
Course Start Month(s)	Full-time: October

Institutions delivering the course

This course is delivered by the School of Water, Energy and Environment primarily through the Cranfield Soil and Agri-food Institute (CSAFI)

Our expertise covers basic soil physics, chemistry and biology; pedology and pedometrics; mathematical modelling; spatial data sciences; and systems-level integration. We also have expertise in more applied aspects of soil and land management: soil protection and degradation, soil erosion and sustainable land management including soil policy formulation.

The Institute's research is supported by the UK Research Councils, Defra, the EU and various private sector organizations. We are part of the NERC/BBSRC STARS Centre for Doctoral Training on soil science and we lead the NERC DREAMS Centre for Doctoral Training on environmental data and informatics.

We have some of the best laboratory and field facilities for soils research in Europe, including:

- laboratories for soil physics, chemistry and biology
- the Soil Management Facility for soil mechanics and study of soil degradation processes, soil management and conservation, and soil-machine interactions
- the Wolfson Field Laboratory for whole-soil carbon balances and trace gas emissions, including stable isotope measurements
- access to field demonstration and trial sites

In addition, Cranfield will be leading the soil health component of the Centre for Crop Health and Protection (CHAP) under the Government's Agri-Tech Initiative. With over £3 million in new capital equipment to complement existing facilities, Cranfield will create the leading soils research facility in Europe. This will complement our agricultural engineering capability as part of the new Agri-EPI centre.

CSAFI also has extensive soil spatial data holdings. We are the UK National Reference Centre for soil, and a member of the European Environment and Observation Network (EIONET) and of the European Soil Bureau Network. We hold national and international soil reference data and samples, publically-accessible through the Land Information System (LandIS) and the World Soil Survey and Archive Catalogue (WOSSAC).

Cranfield University interacts with the following institutions and in the following ways:

The Course has an Industrial Advisory Panel that formally meets each year. Current members of the Industrial Advisory Panel include: ADAS, IAgRE, FWAG, Waste Recycling Group, Cresswell Associates, RSPB, Geospatial Insight, ERM, Natural England, the Environment Agency, Oakdene Hollins, the Landscape Institute and the National Trust.

In addition a Programme Review Group of the Landscape Institute reviews the course each year. There are currently three members of the review group: two landscape consultants and one from Essex County Council.

Representatives from the Landscape Institute, the Institution of Agricultural Engineers, and the British Society of Soil Scientists make presentations to the group during the year.

Students are involved with field trips off-campus. In recent years these have included the following organisations: Peak District National Park, Moors for the Future, Allerton Research and Educational Trust, Roxhill Manor Farm, FWAG, and the Forestry Commission.

Students are involved in Group Projects where they work together with their peers from other MSc courses in a particular project closely associated with organisations such as Tarmac, the Coal Authority, the Environment Agency etc which offers an opportunity to apply their knowledge base in a problem solving context that is multi-disciplinary.

Students can undertake their individual research project off campus. In recent years, projects have been undertaken with the Environment Agency, Heineken, Natural England, Yorkshire Water, FWAG, the National Trust, agricultural engineering companies, Unilever, Leverhulme Trust, RSPB, various County Councils, and Shanghai University.

The course benefits from links to a significant number of European Universities through the Cranfield University European Partnership Programme.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited formally by the Institute of Agricultural Engineers (IAgrE) and the Landscape Institute until 2021 and 2019 respectively.

2. What are the aims of the course?

Appropriate land management is vital if individuals, communities, businesses and governments are to balance successfully the competing demands of land use to provide food, fuel, high quality water, timber and fibre with those of environmental regulation, conservation, landscape, recreation and urban development.

The Land Reclamation and Restoration course has the specific aims of:

- To impart knowledge and develop understanding in soil engineering and the soil-plant system with particular regard to land reclamation and ecological restoration.
- To provide the skills to assess, plan, execute and implement strategies needed to restore, reclaim and remediate damaged land in the public and corporate sectors.

This programme is intended for the following range of students:

- Those wishing to work nationally or internationally with agribusiness companies, governments, and government agencies that need to address land reclamation and restoration problems.
- Those wishing to work in land reclamation and restoration research and consultancy.
- Those wishing to work in the NGO sector on international land reclamation and restoration problems.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Land Reclamation and Restoration

3

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Develop appropriate and sustainable solutions to the management of land resources in natural and man-made environments, at a range of spatial scales, with due regard to the technical, social and institutional constraints imposed by the environment
- ILO 2. Demonstrate applications of principles of soil-plant interactions and use of appropriate options in restoring soil functions
- ILO 3. Evaluate suitability of theoretical considerations and apply it in an ecosystems approach to address challenges in land remediation and restoration

B. Postgraduate Diploma in Land Reclamation and Restoration

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 4. Assess bespoke tools and its suitability to be applied in a sustainable land reclamation and restoration context
- ILO 5. Integrate knowledge, understanding and skills from the taught modules in a real-life situation to address problems faced by industrial clients; creating new problem diagnoses, designs, or system insights; and communicating findings in a professional manner in written, oral and visual forms.

C. MSc in Land Reclamation and Restoration

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 6. Define a research question, develop aim(s) and objectives, select and execute a methodology, analyse data, evaluate findings critically and draw justifiable conclusions, demonstrating self-direction and originality of thought
- ILO 7. To communicate their individual research via a thesis and in an oral presentation in a style suitable for academic and professional audiences.

4. How is the course taught?

The MSc course is taught in three sections: taught modules (40%), group projects (20%), and an individual research project (40%). The taught modules are typically delivered in one-week blocks between October and February. The course material is delivered within one week with a second week focussed on assimilation and the completion of an assignment. The teaching methods include debates, practical sessions, field visits, lectures, seminars, and presentations. The Group Project is a group-based activity typically undertaken between February and May. The project is designed to integrate knowledge, understanding and skills from the taught modules in a real-life

situation. For the individual research project, each student is allocated a supervisor. Guidance sessions are provided as to what is required from the thesis and oral presentation.

Within the induction week, students will be introduced to personal development planning and asked to reflect on their transferable skills and to take ownership of their personal development during the course. During the group projects students will be given training in group-working and will reflect on their personal development. Part time students who cannot attend the scheduled induction week can have ad hoc induction sessions arranged.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction	0
GIS Fundamentals	10
Soil Systems	10
Soil Engineering, Contaminant and Nutrient Management	10
Landscape Ecology	10
Module 10	10
Ecological Restoration	10
ELECTIVE MODULES:	
N/A	
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction	0
GIS Fundamentals	10
Soil Systems	10
Soil Engineering, Contaminant and Nutrient Management	10
Landscape Ecology	10
Module 10	10
Ecological Restoration	10

Group Project (Full Time Students)	10 40
ELECTIVE MODULES:	
Principles of Sustainability	10
Aerial Photography and Digital Photogrammetry	10
Land Engineering and Water Management	10
Land Resource Planning	10
Existing Part Time Students:	
Group Project	40
OR	
Dissertation	40
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Induction	0
GIS Fundamentals	10
Soil Systems	10
Soil Engineering, Contaminant and Nutrient Management	10
Landscape Ecology	10
Module 10 (full time only)	10
Module 11 (existing part time only)	10
Ecological Restoration	10
Module 13 (Group Project)	40
Module 14 in place of Module 13 (existing part time students)	40
Thesis project	80
ELECTIVE MODULES:	
Principles of Sustainability	10
Aerial Photography and Digital Photogrammetry	10
Land Engineering and Water Management	10
Land Resource Planning	10
Existing Part Time Students:	
Group Project	40
OR	
Dissertation	40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);^{3 4}
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Please see the course structure document for details on the individual elements of the course. Full-time students register for the course in October and are expected to complete the MSc course within 12 calendar months.

This course is also offered on a part-time basis. In such a situation, students typically complete the various components of the course over two or three years. One example is to complete five taught modules in year 1, three taught modules and a work-based project in year 2, and a thesis and oral presentation in year 3. An alternative is to complete the autumn term modules in year 1, to complete a research thesis between January and December, and then to complete the remaining three taught modules and group project between January and May.

³ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
1	I-ENV-INWK	Induction Week	T Brewer	33		0	Y	N/A	01/10/18	05/10/18	N/A	AO	N/A				N/A	
2	I-EMB-A1122	Principles of Sustainability	P Burgess	26		10	Y	N/A	08/10/18	12/10/18	40	ICW	100				FT 20/10/18 PT 03/11/18	July 19
3	I-GIM-A1135	Aerial Photography and Digital Photogrammetr	T Brewer	50		10	Y	N/A	08/10/18	12/10/18	40	ICW	100				FT - 20/10/2018 PT - 03/11/2018	July 19

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment								
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates			
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
		y																	
4	I-GIM-A1131	GIS Fundamentals	T Brewer	42		10	Y	N/A	22/10/18	26/10/18	40	ICW	100					FT - 03/11/2018 PT - 17/11/2018	July 19
5	I-LAM-A1138	Soil Systems	J Hannam	34		10	Y	N/A	05/11/18	09/11/18	40	ICW	100					FT - 24/11/18 PT - 08/12/18	July 19
6	I-LAM-SECN M	Soil Engineering, contaminant and nutrient management	S de Baets	33		10	N	N/A	12/11/18	16/11/18	40			100	ICW IPRES	60% 40%	ICW - FT - 01/12/18 PT - 15/12/18 IPRES - FT/PT - Week commencing ; 19/11/18	July 19	
7	I-LAM-A1145	Land Engineering and Water	L Deeks	30		10	Y	N/A	03/12/18	07/12/18	40	ICW	100					FT 15/12/18 PT 07/01/19	July 19

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
		Management																
8	I-ILE-ALRP	Land Resource Planning	T Brewer	30		10	N	N/A	03/12/18	07/12/18	40	ICW	100				FT 15/12/18 PT 07/01/19	July 19
9	I-LAM-A1522	Landscape Ecology	R Corstanje	30		10	Y	N/A	07/01/19	11/01/19	40	ICW	100				FT - 19/01/19 PT - 02/02/19	July 19
10	I-LAM-A1523	Soil Erosion Control: Principles and Practices (FT)	R Simmons	40		10	Y	N/A	21/01/19	25/01/19	40			100	GCW ICW	50% 50%	GCW & ICW 09/02/19	July 19
11	I-LAM-A1524	Soil Erosion Control: Principles and Practices (PT)	R Simmons	40		10	Y	N/A	21/01/19	25/01/19	40	ICW	100				23/02/19	July 19
12	I-LAM-A1148	Ecological Restoration	J Harris	32		10	N	N/A	04/02/19	08/02/19	40	ICW	100				FT 16/02/19 PT 02/03/19	July 19
13	I-ENV-GRPP	Group Project	Supervisors	16		40	Y	N/A	18/02/19	03/05/19	50	GPROJ ICW	80 20				GPROJ 29/04/19 ICW	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment								
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
																		04/05/19	
14	I-ENV-DISS	Dissertation	Supervisors	10		40	Y	N/A	01/10/18	27/09/19	50	IPROJ IPRES	80 20					27/09/19	
15	I-ENV-THESIS	Individual Research Project	Supervisors	20		80	Y	N/A	06/05/19	06/09/19	50	THESIS OR	90 10	N/A	N/A	N/A		02/09/19	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
I-EMB-A1122	Principles of Sustainability	Environmental Management for Business	<ul style="list-style-type: none"> • Future Food Sustainability • Land Reclamation and Restoration • REMS EngD
I-GIM-A1135	Aerial Photography and Digital Photogrammetry	Geographical Information Management	<ul style="list-style-type: none"> • Land Reclamation and Restoration
I-GIM-A1131	GIS Fundamentals	Geographical Information Management	<ul style="list-style-type: none"> • Land Reclamation and Restoration • REMS EngD
I-LAM-A1522	Landscape Ecology	Land Reclamation and Restoration	<ul style="list-style-type: none"> • Geographical Information Management
I-LAM-A1145	Land Engineering and Water Management	Land Reclamation and Restoration	<ul style="list-style-type: none"> • Environmental Engineering
I-LAM-A1523	Soil Erosion Control: Principles and Practices (Full Time Study)	Land Reclamation and Restoration	<ul style="list-style-type: none"> • Environmental Engineering
I-LAM-A1524	Soil Erosion Control: Principles and Practices (Part Time Study)	Land Reclamation and Restoration	<ul style="list-style-type: none"> • Environmental Engineering
I-LAM-A1138	Soil Systems	Land Reclamation and Restoration	<ul style="list-style-type: none"> • Future Food Sustainability

7. How are the ILOs assessed?

The following assessment types are utilised:

The course uses a range of assessment types. Students on the MSc can typically expect to have one written exam, seven pieces of individual assessment by submitted work, one group project, and one element assessed by a thesis and an oral presentation.

This approach has been adopted in order to assess the ability of the student to demonstrate their ability in a range of environments.

A. Postgraduate Certificate

Award ILOs	ILO 1	ILO 2	ILO 3
Module No.			

Award ILOs Module No.	ILO 1	ILO 2	ILO 3
4	ICW		
5		ICW	
6		ICW IPRES	
9			ICW
10			GCW ICW
11			ICW
12			ICW

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 4	ILO 5
2	ICW	
3	ICW	
7	ICW	
8	ICW	
13		GPROJ ICW
14		IPROJ IPRES

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 6	ILO 7
15	THESIS/ ORAL	THESIS/ ORAL

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and

additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the expectations and indicators of sound practice of the QAA Quality Code Chapter B10: Managing Higher Education Provision with Others, with regards to the management and operation of the partnership and that the academic standards and the quality of the student experience are assured in line with the remaining chapters of the QAA Quality Code. The delivery of new partnership provision is ultimately approved by the University's Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

9. What opportunities are graduates likely to have on completing the course?

Successful students go on to a wide-range of careers such as consulting engineers, conservationists, environmental and design planners/consultants, land and sustainability managers and advisors, researchers, and educationalists.

Employers include statutory agencies and ministries, conservation trusts, environmental companies, international development organisations, land and natural resource management businesses, large agri-food companies, local authorities, non-government organisations (NGOs), and research organisations. Recent destinations of graduates include:

Assistant Restoration Managers (x3), Tarmac
Soil Scientist: Wardell Armstrong, UK
•Soil and Water Engineer: ADAS, UK:
•Project Manager / Reclamation Specialist: SNC-Lavalin Inc., Canada
•PhD Research Cranfield University (x3), UK
•PhD Lancaster University (x2), UK
•Research Assistant, Cranfield University, UK
•Planning Officer: Maryland Department of Planning, Maryland, USA
•Monitoring Officer: Listers Geotech, UK.

COURSE SPECIFICATION



Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Management and Corporate Sustainability

Date of first publication/latest revision: May 2018

1. What is the course?

Course information

Course Title	Management and Corporate Sustainability
Course code	MSMPSFTC, PDMPSTC, PCMPSFTC
Academic Year	2018/19
Valid entry routes	MSc
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time
Location(s)¹ of Study	Cranfield
School(s)	School of Management
Theme	Leadership and Management
Centre	Policy, Sustainability and Performance
Course Director	Professor Hugh Wilson
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ – Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	1 year
Course Start Month(s)	September

Institutions delivering the course

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

This course is delivered by the School of Management, Leadership and Management Theme, Centre for Policy, Sustainability and Performance where the research interests include business sustainability and risk management.

There are no academic partners for this course.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited by The Chartered Management Institute (CMI)

2. What are the aims of the course?

Cranfield University offers this course to add value to first degrees in Business and Management, Applied Science fields, Humanities and the Social Sciences. It seeks to develop candidates from different academic disciplines and backgrounds, with perhaps some relevant experience, who want to undertake a sustainability related qualification and future career.

The aim of the MSc in Management and Corporate Sustainability is to add value to applicants' first degrees by providing individuals with an integrated and critical awareness of management and organisations (e.g. private, public and third sector) and subsequently develop a specialised focus in corporate sustainability, and assisting them in pursuing entry level managerial careers within those organisations. More specifically it seeks to ensure the:

- Provision of a comprehensive and advanced understanding of the range of global sustainability challenges facing organisations in public, private and third sectors.
- Integration and application of in-depth knowledge and understanding of management sub-disciplines to support the development of corporate responsibility and sustainability initiatives.
- Ability of students to synthesise large elements of data to inform management decision making.
- Development of students to apply management and applied science concepts for improving the effectiveness of organisations in addressing sustainability issues.
- Coalescence of previous work experience and knowledge, concepts and theories creatively to enhance corporate sustainability policy and practice.
- Development of student capabilities to manage complex sustainability agendas and apply them in a practical and pragmatic way within a specific organisational context.
- Enhancement of lifelong learning through the development of management, sustainability, communication, team working, negotiation, project planning capabilities and self-direction, so students acquire the necessary high-level skills employers favour for making contributions to business, public service and society.

This is a predominantly pre-work experience programme intended for graduates from a wide range of backgrounds who are interested in developing a sustainability management related career. This course may also appeal to candidates with first degrees that are not in a business academic discipline but, have some relevant sustainability experience and would benefit from obtaining a post-graduate qualification as a developmental step in their career.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Demonstrate a systematic understanding of the principles of management and how these apply to corporate sustainability.
- ILO 2. Use new management skills to support decision making in the development of corporate sustainability strategy.
- ILO 3. Identify the appropriate sustainability management frameworks and methodologies to address specific sustainability issues.
- ILO 4. Show ability for independent learning and an interest in advancing knowledge and understanding.
- ILO 5. Demonstrate transferrable skills, including:- time management, general communication, negotiation, reflection, report writing and presentational and team working.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 6. Integrate their learning from the PgCert.
- ILO 7. Critically review the application of current corporate responsibility and sustainability management research and evaluate its relevance to organisational practice.
- ILO 8. Exhibit originality and self-direction in the application of knowledge, including data and information collected by the student.
- ILO 9. Comprehensively appraise leading corporate responsibility and sustainability academic literature.
- ILO 10. Demonstrate additional transferrable skills, including; effective communication, consultancy, cultural awareness and interpersonal team working and leadership.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 11. Integrate their learning from the PgCert and PgDip and apply it to a research project.
- ILO 12. Independently and confidently apply management and corporate sustainability theories, tools/techniques to a variety of situations including case studies, business simulations and the individual project.
- ILO 13. Demonstrate the ability to create and adapt appropriate sustainability management frameworks and contextualise for a specific organisational issue accurately.
- ILO 14. Display practical ability in self-directed research, data gathering, data analysis and interpretation, report writing and presentation skills.
- ILO 15. Judge appropriate research methodologies for conducting research, and draw justifiable inferences from the data and analysis generated.
- ILO 16. Critically synthesise and evaluate the academic research within and from related sustainability management disciplines.
- ILO 17. Undertake independent study (including empirical work) on a relevant corporate sustainability domain, demonstrating the ability to plan, manage and execute an industrial (private, public or charitable sectors) or research based project with specified time scales.
- ILO 18. Produce a thesis and critically evaluate the interpretations of the findings.

4. How is the course taught?

Overall the aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lecturers, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills. Additional practical expertise will be provided by visiting fellows and guest speakers.

Each assessed module comprises 25 hours of class contact time with a further 75 hours of study time to consolidate learning and carryout assignments, giving a 100 notional learning hours.

The teaching methods are:

- Lectures
- Student centred learning/reflection
- Case studies
- Video and audio materials
- Simulation
- Tutorials
- Problem based learning projects
- Individual research project with academic supervisors

In addition students will be supported in their learning and personal development by:

- Orientation week
- Library induction, referencing and plagiarism sessions
- PDP specifically supported through SOM careers development sessions and 2 modules specifically
 - Understanding and managing people and organisations
 - Management consulting
- Virtual Learning Environment
- Learning teams supported by an academic tutor

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Six modules from 1-12 which must include 2 of the following: <ul style="list-style-type: none"> • Leading Corporate Sustainability (8) • Creating Sustainable Organisations (9)* • Sustainability in Practice (10)* • Applied Science and Technology for Environmental Sustainability (11) * Modules 9 and 10 share an integrated assessment and therefore both must be taken to be considered towards the Award.	60
ELECTIVE MODULES:	
N/A	N/A
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-12	120
ELECTIVE MODULES:	
N/A	N/A
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-12	120
Thesis 13	80
ELECTIVE MODULES:	
N/A	N/A
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);^{3 4}
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);

³ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
- it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. **How is the course structured?**

The course will be offered on a full-time basis only. Full-time students register for the course in September and are expected to complete the course within 12 calendar months.

Each assessed module is based on 100 notional learning hours, comprising 25 class contact hours with a further 75 hours of private study to consolidate learning and to carry our assessments.

The majority of the course modules will be taught as a series of lectures within 1 or 2 week blocks within in first 3 terms of the 4 term framework. The integrating Research Methods course will be taught in term 3. The international study tour is also planned for term 3 (yet to be confirmed). The individual thesis project is undertaken during terms 3 and 4. Please note there may be some variation to module dates due to the scheduling of timetables across a number of academic programmes.

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
1	M-T/MMT	Marketing Management	Dr Emma MacDonald	20		10	Y		28/01/19	04/02/19	40	ICW	100				01/03/19	
2	M-T/OBA	Organisational Behaviour: Application	Dr Richard Kwiatkowski	20		10	Y		09/10/18	13/11/18	40	ICW	100				30/11/18	
3	M-L/ACF Occ C	Accounting and Finance	Dr Matthias Nnadi	20		10	Y		02/10/18	24/10/18	40	EX	100				14/12/18	
		Improving Decision Quality with Management Science							WITHDR AWN									
4	M-E/SEM	Social Entrepreneurship	Oksana Koryak	20		10	Y		08/04/19	18/04/19	40			GPRES RP	50 50		18/04/19 17/05/19	

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar				Assessment						
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
5	M-T/ECM	Economics for Managers	Dr Catarina Figueira	20		10	Y		12/11/18	06/12/18	40	GCW	100				11/01/19	
6	M-T/MNO	Managing Operations	Dr Abdelkader Aoufi	20		10	Y		01/10/18	12/10/18	40	GCW	100				12/11/18	
7	M-T/STG	Strategic Management	Dr Richard Schoenberg	20		10	Y		28/02/19	14/03/19	40	EX	100				22/03/19	
		Management Consulting							WITHDR AWN									
8	M-T/LCS	Leading Corporate Sustainability	Rosina Watson	20	5	10	Y		07/01/19	16/01/19	40	ICW	100				11/02/19	
9	M-C/CSO	Creating Sustainable Organisations	Prof David Grayson	20		10	N		06/03/19	08/03/19	40			MULTI – Integrated Assessment	GPRES ICW	70 30	16/05/19	
10	M-C/SIP	Sustainability in Practice	Prof David Grayson	20		10	N		30/04/19	16/05/19								
11	M-C/AST	Applied Science and Technology for Environmental Sustainability	Dr Phil Longhurst	20		10	N		19/11/18	23/11/18	50	ICW	100				07/12/18	
12	M-T/RMS change code to EBM	Evidence-based Management	Valentina Battista	20		10	Y		08/04/19	21/06/19	N/A	ICW	100				24/05/19	
13	M-C/THS	Thesis	Prof Hugh Wilson (module	10		80	N		01/10/18	30/08/19		THESIS	100				02/09/19	

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers. ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
			convenor) + Supervisors drawn from faculty and visiting fellows/ registered teachers															

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Course(s)/programme(s) that share the module</u>
M-L/ACF	Accounting and Finance	Logistics and Supply Chain Management	Procurement and Supply Chain Management; Business and Strategic Leadership; Management; Management and Entrepreneurship
M-T/MMT	Marketing Management	Management	Management, Management and Entrepreneurship
M-T/OBA	Organisational Behaviour: Application	Management	Management, Management and Entrepreneurship
M-E/SEM	Social Entrepreneurship	Management and Entrepreneurship	Management and Corporate Sustainability
M-T/ECM	Economics for Managers	Management	Management and Corporate Sustainability
M-T/MNO	Strategic Operations Leadership	Management	Management and Corporate Sustainability, Management and Entrepreneurship
M-T/STG	Strategic Management	Management	Management and Corporate Sustainability, Management and Entrepreneurship
M-T/LCS	Leading Corporate Sustainability	Management	Management and Corporate Sustainability
M-T/EBM	Evidence based Management	Management	Management, Management and Entrepreneurship

7. How are the ILOs assessed?

The following assessment types are utilised:

The course uses a range of assessment types. Students can expect to have 3 written examinations, 13 pieces of assessment by submitted work and one assessment by presentation (although there are formative assessment by presentation and debate) or no assessment by viva.

This mixed approach of assessment combined with examinations has been adopted in order to adopt a range of assessment with presentations which are not formally assessed.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

Award ILOs	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6	ILO 7	ILO 8	ILO 9	ILO 10	ILO 11	ILO 12	ILO 13	ILO 14	ILO 15	ILO 16	ILO 17	ILO 18	
Module No.	Postgraduate Certificate					Postgraduate Diploma					MSc								
1	√				√	√				√									
2	√				√	√				√									
3	√				√	√				√									
4						√	√	√	√	√	√								
5	√				√	√				√									
6	√				√	√				√									

7	√				√	√				√								
8	√		√		√	√	√		√	√								
9	√		√		√	√	√		√	√								
10	√	√	√	√	√	√	√	√	√	√								
11	√	√	√		√	√	√		√	√								
12														√	√	√		√
13		√	√	√			√	√	√	√	√	√	√	√	√	√	√	√

(Module numbers should correspond with those used in the Course module table above.)

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
Integrated Assignment 1	<ul style="list-style-type: none"> Module 9 - Creating Sustainable Organisations Module 10 - Sustainability in Practice 	GPRES	70%
<ul style="list-style-type: none"> Group Presentation Individual Reflection 		Individual Reflection	30%

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review. For collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focussed Review which looks at each course in depth. In addition occasional site inspection visits are made.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

9. What opportunities are graduates likely to have on completing the course?

The course will provide a comprehensive and integrated understanding/knowledge of sustainability management with the practical skill set commensurate with entry to a first line managerial post. As such, many of the students may pursue graduate entry schemes but will equally be attractive to large and SME commercial, public sector and charitable sectors where the managerial component will add value to the student's technology based or single disciplined first degree. Evidence from current recruitment patterns for our young MSc students (on specialist MSc) already shows the trend toward graduate entry schemes and many companies transferring their talent search to post-graduates rather than fresh graduates alone.

COURSE SPECIFICATION



Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Management and Entrepreneurship

Date of first publication/latest revision: February 2017

1. What is the course?

Course information

Course Title	MSc in Management and Entrepreneurship
Course code	MSMERFTC, PDMERFTC, PCMERFTC, MSMEOPTC, MSMEOFTC
Academic Year	2018-2019
Valid entry routes	MSc
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time, Part-time
Location(s)¹ of Study	Cranfield Campus and Muscat University, Oman
School(s)	School of Management
Theme	Leadership and Management
Centre	Bettany Centre for Entrepreneurship
Course Director	Dr Oksana Koryak
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc – one year, Part-time MSc – up to three years
Course Start Month(s)	September

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Institutions delivering the course

This course is delivered by the Bettany Centre for Entrepreneurship at the School of Management (SOM) where the research interests include:

- Growth of entrepreneurial ventures
- Forecasting the entrepreneurial sector
- Entrepreneurial finance and de-risking ventures
- Intellectual property rights and market performance
- The impact of business planning on new venture performance
- Entrepreneurial Strategy
- Family business management
- Corporate entrepreneurship
- Women's entrepreneurship

Teaching and/or assessment is provided by SOM Faculty as well as selected visiting fellows (already teaching on the MSc in Management (MiM) programme or working in other renowned universities in the field of Entrepreneurship and Enterprise Development). Thesis projects will be mainly supervised by Bettany Centre for Entrepreneurship faculty and those PhD students who have a Recognised Teacher Status. The students will have an option either to do a research project or to create a business plan for a new entrepreneurial venture or to conduct a growth audit for an existing entrepreneurial venture.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited by The Chartered Management Institute (CMI).

2. What are the aims of the course?

In this world of downsizing, restructuring and technological change, notions of traditional careers have been challenged. More and more individuals are aspiring to create their own world of unlimited opportunities. Not only individuals, but governments have recognised the positive impact of entrepreneurship on the economic development. There's no single Government (in either the developed or the developing world), which is not paying at least lip service to entrepreneurship promotion and enterprise development. Because they have realised that entrepreneurs are empowering change through new business models and bringing hope to millions of people world-wide. The research shows that majority of entrepreneurial ventures fail in the first few years of their existence. The most of the failures are because their owner-managers lack basic management skills.

They do things on hit and trial basis, by learning these skills in the wild - and that's where Cranfield's MSc Management and Entrepreneurship Course makes a difference – by equipping our students with both the entrepreneurial characteristics and traits as well as management skills so that they can start and run their businesses in an effective and efficient manner.

Cranfield University offers this course in order to add value to first degrees in Business and Management, Economics, Applied Science fields, Humanities and Social Sciences. It seeks to develop candidates from different academic disciplines and backgrounds, with perhaps some relevant although limited experience, who want to either start their own business or grow their family business entrepreneurially, or manage a large organisation in an entrepreneurial manner.

The aim of the MSc in Management and Entrepreneurship is to add value to applicants' first degrees by providing individuals with an integrated and critical awareness of management and organisations (e.g. private, public and third sector) and subsequently, develop a specialised focus in entrepreneurship, and assisting them in pursuing an entrepreneurial career. More specifically it seeks to ensure the:

- Provision of a comprehensive and advanced understanding of the impact of entrepreneurship and entrepreneurial processes at international, regional and national levels, the community level and the level of firm and individual.
- Integration and application of in-depth knowledge and understanding of management sub-disciplines to support the start-up and growth of entrepreneurial ventures.
- Provision of opportunities for students to develop critical perspectives on theories and to review and evaluate the appropriateness and potential value of concepts, models and techniques that underpin the constituent entrepreneurship and management subjects.
- Development of student capabilities to critically analyse the current issues in the field of management and entrepreneurship.
- Enhancement of lifelong learning through the development of management and entrepreneurship knowledge, communication, team working, negotiation, project planning capabilities and self-direction, so students acquire the necessary high-level skills employers favour for making contributions to their own and/or family businesses, social enterprises, or large organisations interested to introduce entrepreneurial culture as a tool for business growth.

This is a predominantly pre-work experience programme intended for graduates from a wide range of backgrounds including science, engineering and technology who are interested in developing a career in entrepreneurship and enterprise development. This course may also appeal to candidates with first degrees that are not in a business academic discipline but that would benefit from obtaining a post-graduate qualification that combines management and entrepreneurship as a developmental step in their career.

This course has been designed not only to teach ‘about’ theory of entrepreneurship. We aim to prepare our student ‘for’ spotting opportunities, generating ideas and being creative and innovative enough to raise resources to implement those ideas successfully. We will achieve this goal ‘through’ a range of inclusive and interactive teaching pedagogies and learning methods – delivered by a team of entrepreneurial faculty members, who have either started and managed their own businesses or have been engaged with real-life entrepreneurs, either through conducting research, or by providing consultancy, coaching, and mentoring.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Demonstrate a systematic application and a critical awareness of current management and entrepreneurship research and to evaluate its relevance to industrial and commercial practice.
- ILO 2. Show a conceptual understanding that enables the student to evaluate critically current research and/or methodologies, develop critiques of them, and, where appropriate, adapt them.
- ILO 3. Demonstrate the ability to identify the appropriate management and entrepreneurship frameworks for an issue or situation under consideration, and to apply the tool or technique accurately.
- ILO 4. Undertake and show an ability for independent learning and an interest in advancing their knowledge and understanding and developing new skills to a high level.
- ILO 5. Justify and defend the ability for independent learning and an interest in advancing knowledge and understanding and developing new skills to a high level demonstrated through critical thinking, strategic comparison and review.
- ILO 6. Evaluate the entrepreneurial characteristics, entrepreneurial processes, and the entrepreneurial event in different social, economic, political and legal environments.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 7. Select and apply different tools available for creating new business opportunities, and of different forms of support available to entrepreneurs and how to utilise that support in an effective manner.
- ILO 8. Independently apply entrepreneurship theories, concepts, models, tools and techniques to a variety of situations including case studies, business simulations and the individual project.
- ILO 9. Adapt appropriate management and entrepreneurship frameworks and contextualise them for specific issues accurately in start-up and growth stages of entrepreneurial ventures.
- ILO 10. Exhibit originality in the application of knowledge, together with a practical understanding of how established techniques of research and inquiry in entrepreneurship are used to create and interpret knowledge in the discipline.
- ILO 11. Show self-direction and originality in tackling and solving problems both in the start-up and growth stages of entrepreneurial ventures.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 12. Integrate their learning from the PgCert and PgDip and apply it to a research project or to prepare a business plan.
- ILO 13. Critically evaluate and synthesise the published literature within and across the entrepreneurship and management disciplines either for their research project or for preparing a business plan.
- ILO 14. Conduct independent study on a relevant entrepreneurship/management domain, demonstrating the ability to plan, manage and execute a research-based project with specified timescales, or prepare a detailed business plan for a new entrepreneurial venture demonstrating an ability to plan, access and mobilise resources for new venture.
- ILO 15. Produce a high-quality thesis or a business plan and critically evaluate the interpretations of the data available.

4. How is the course taught?

Overall the aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem-solving skills. Additional practical expertise will be provided by guest speakers.

Each assessed module comprises 20 hours of class contact time with a further 80 hours of study time to consolidate learning and carry out assignments, giving a 100 notional learning hours.

The teaching methods are:

- Lectures
- Student centred learning/reflection
- Case studies
- Video and audio materials
- Simulation
- Tutorials

- Problem-based learning projects
- Individual research project with academic supervisors

In addition to the teaching methods outlined above, students will be supported in their learning and personal development by:

- Orientation week
- Library induction, referencing and plagiarism sessions
- Virtual Learning Environment
- Learning teams supported by an academic tutor

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

Management and Entrepreneurship (Cranfield) (Full-time only)

A. MSc

An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1–9	90
Module 15	0
Thesis 16	80
ELECTIVE MODULES:	
Module 10-14	30
TOTAL:	200

Management and Entrepreneurship (Muscat) (Full-time and Part-time)

B. MSc

An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-9	90
Module 11-13	30
Module 14	0
Thesis 15	80
ELECTIVE MODULES:	
N/A	N/A
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);^{3 4}
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 12 calendar months.

Each assessed module is based on 100 notional learning hours, comprising 20 class contact hours with a further 80 hours of private study to consolidate learning and to carry our assessments.

³ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Management and Entrepreneurship (Cranfield)

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Residential ⁷ Start Date	Residential ⁷ End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
1	M-T/MMT	Marketing Management	Prof Emma MacDonald	20		10	Y		28/01/19	06/02/19	40	ICW	100				01/03/19	
2	M-T/OBA	Organisational Behaviour: Application	Dr Richard Kwiatkowski	20		10	Y		09/10/18	13/11/18	40	ICW	100				30/11/18	
3	M-L/ACF Occ C	Accounting and Finance	Dr Matthias Nnadi	20		10	Y		02/10/18	24/10/18	40	EX	100				14/12/18	
4	M-T/ENT Occ B	Entrepreneurship	Dr Oksana Koryak	20		10	Y		05/11/18	12/11/18	40	ICW	100				23/11/18	
5	M-E/ENF	Entrepreneurial Finance	Dr Stephanie Hussels	20		10	Y		14/11/18	22/11/18	40 40	EX GCW	50 50				EW 14/12/18 07/12/18	

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
6	M-E/MBG	Managing Business Growth	Dr Shailendra Vyakarnam	20		10	Y		07/01/19	11/01/19	40	ICW	100				25/01/19	
7	M-T/MNO	Managing Operations	Dr Abdelkader Aoufi	20		10	Y		01/10/18	12/10/18	40	GWC	100				12/11/18	
8	M-T/STG	Strategic Management	Dr Richard Schoenberg	20		10	Y		28/02/19	14/03/18	40	EX	100				EW 18/03/18	
9	M-T/DIN	Disruptive Innovation	Dr Leon Williams	20		10	Y		25/02/19	28/02/19	40			100 MULTI	GCW ICW	40 60	15/03/19	
10	M-E/ACT	Accelerating the Commercialisation of Technology	Dr Shailendra Vyakarnam	20		10	N		18/02/19	22/02/19	40 40	GCW GPRES	50 50				08/03/19 06/03/19	
11	M-E/CEN	Corporate Entrepreneurship	Dr Oksana Koryak	20		10	N		07/01/19	31/01/19	40	ICW	100				08/02/19	
12	M-E/FBM	Family Business Management	Dr Stephanie Hussels	20		10	N		14/01/19	17/01/19	40	GCW	100				01/02/19	
13	M-E/SEM	Social Entrepreneurship	Dr Oksana Koryak	20		10	N		08/04/19	08/06/19	40			100 MULTI	GPRES RP	50 50	18/04/19 17/05/19	
14	M-T/PML	People Management and Leadership	Prof Michael Dickmann	20		10	Y		19/11/18	04/12/18		EX	100				14/12/18	
15	M-T/EBM	Evidence-based Management	Valentina Battista	20		0	Y		08/04/19	21/06/19	N/A	AO	N/A				N/A	
16	M-E/THS	Thesis (Business Plan)	Supervisors drawn from faculty and visiting fellows/ registered teachers	10		80	N		08/04/18	30/08/18		THESIS	100				02/09/19	

Management and Entrepreneurship (Muscat)

Module Number	Module code	Title	Module Leader	Contact hours ¹²	Total hours delivered by Visiting Lecturers ¹³	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ¹⁴ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ¹⁵ (%) of independent assessments	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁷	Assessment Submission and/or exam date ¹⁸	Assessment / Exam Retake date	
1	M-T/MMT Occ B	Marketing Management	Prof Emma Macdonald / Dr Farah Arkadan	20		10	Y		FT/PT 23/10/18	FT/PT 01/11/18	40	ICW	100				29/11/18	
2	M-T/OBA Occ B	Organisational Behaviour: Application	Dr Richard Kwiatkowski	20		10	Y		FT/PT 10/02/18	FT/PT 14/02/18	40	ICW	100				14/03/19	
3	M-L/ACF Occ TBC	Accounting and Finance	Dr Simon Templar	20		10	Y		FT/PT 13/01/19	FT/PT 17/01/19	40	EX	100				Exam Week 07/03/19	
4	M-T/ENT Occ C	Entrepreneurship	Dr Oksana Koryak	20		10	Y		FT/PT 08/10/18	FT/PT 11/10/18	40	ICW	100				08/11/18	
5	M-E/ENF Occ C	Entrepreneurial Finance	Dr Stephanie Hussels	20		10	Y		FT/PT 20/01/19	FT/PT 24/01/19	40 40	EX GCW	50 50				Exam week 07/03/19	
6	M-E/MBG Occ C	Managing Business Growth	Dr Shailendra Vyakarnam	20		10	Y		FT/PT 04/11/18	FT/PT 08/11/18	40	ICW	100				06/12/18	
7	M-T/MNO Occ B	Managing Operations	Dr Abdelkader Aoufi	20		10	Y		FT/PT 25/11/18	FT/PT 29/11/18	40	GCW	100				03/01/19	

¹² Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

¹³ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

¹⁴ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

¹⁵ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

¹⁶ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁷ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹⁸ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Module Number	Module code	Title	Module Leader	Contact hours ¹²	Total hours delivered by Visiting Lecturers ¹³	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ¹⁴ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ¹⁵ (%) of independent assessments	Weighting within module of multi-part assessments ¹⁶	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁷	Assessment Submission and/or exam date ¹⁸	Assessment / Exam Retake date
8	M-T/STG Occ B	Strategic Management	Dr Richard Schoenberg	20		10	Y		FT/PT 21/04/19	FT/PT 26/04/19	40	EX	100				Exam week 18/05/19	
9	M-T/DIN Occ B	Disruptive Innovation	Dr Leon Williams	20		10	y		FT/PT 14/10/18	FT/PT 18/10/18	40			100 MULTI	GCW ICW	40 60	15/11/18	
10	M-T/ACT	Accelerating the Commercialisation of Technology							Not running for Muscat									
11	M-E/CEN Occ B	Corporate Entrepreneurship	Dr Oksana Koryak	20		10	N		FT/PT 24/02/19	FT/PT 28/02/19	40 40	ICW	100				28/03/19	
12	M-E/FBM Occ B	Family Business Management	Dr Stephanie Hussels	20		10	N		FT/PT 03/02/19	FT/PT 07/02/19	40 40	GCW	100				07/03/19	
13	M-E/SEM Occ B	Social Entrepreneurship	Dr Oksana Koryak	20		10	N		FT/PT 03/03/19	FT/PT 07/03/19	40			100 MULTI	GPRES RP	50 50	04/04/19 04/04/19	
14	M-T/EBM Occ B	Evidence-based Management	Delivered locally	20		0	Y		FT/PT 14/04/18	FT/PT 18/04/18	N/A	AO	N/A					
15	M-E/THS Occ B	Thesis (Business Plan)	Supervisors drawn from faculty and visiting fellows/ registered teachers	10		80	N		FT 01/10/19	FT 30/08/19		THESIS	100				05/09/19	

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
M-L/ACF	Accounting and Finance	Logistics and Supply Chain Management	Procurement and Supply Chain Management; Business and Strategic Leadership; Management; Management and Corporate Sustainability, Management and Entrepreneurship
M-T/MST	Marketing Strategy	Management	Management and Corporate Sustainability, Management
M-T/OBA	Organisational Behaviour: Application	Management	Management and Corporate Sustainability, Management
M-T/ENT	Entrepreneurship	Management	Management, Cleantech Entrepreneurship
M-E/ENF	Entrepreneurial Finance	Management and Entrepreneurship	Cleantech Entrepreneurship
M-E/MBG	Managing Business Growth	Management and Entrepreneurship	Cleantech Entrepreneurship
M-T/MNO	Managing Operations	Management	Management and Corporate Sustainability, Management
M-T/STG	Strategic Management	Management	Management and Corporate Sustainability, Management
M-T/DIN	Disruptive Innovation	Management	Management
M-TEBS	Evidence-based Management	Management	Management and Corporate Sustainability, Management

7. How are the ILOs assessed?

The course uses a range of assessment types. Students can expect to have 4 written examinations and 11 assignments, of which one is the thesis. No elements of assessment are done by presentation (although there are formative assessments by presentation and debate) or by viva.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.	ILO 8.	ILO 9.	ILO 10.	ILO 11.	ILO 12.	ILO 13.	ILO 14.	ILO 15.
1	√	√	√	√	√										
2	√	√	√	√	√										
3	√	√	√	√	√										

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.	ILO 8.	ILO 9.	ILO 10.	ILO 11.	ILO 12.	ILO 13.	ILO 14.	ILO 15.
4	√	√	√	√	√	√	√	√							
5	√	√	√	√	√	√	√	√							
6	√	√	√	√	√	√	√	√							

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.	ILO 8.	ILO 9.	ILO 10.	ILO 11.	ILO 12.	ILO 13.	ILO 14.	ILO 15.
7	√	√	√	√	√										
8	√	√	√	√	√										
9	√	√	√	√	√		√								
10						√	√	√	√	√	√				
11						√	√	√	√	√	√				
12						√	√	√	√	√	√				
13						√	√	√	√	√	√				
14	√	√	√	√	√										

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.	ILO 8.	ILO 9.	ILO 10.	ILO 11.	ILO 12.	ILO 13.	ILO 14.	ILO 15.
15	NOT ASSESSED														
16	√				√	√	√	√	√		√	√	√	√	√

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the expectations and indicators of sound practice of the QAA Quality Code Chapter B10: Managing Higher Education Provision with Others, with regards to the management and operation of the partnership and that the academic standards and the quality of the student experience are assured in line with the remaining chapters of the QAA Quality Code. The delivery of new partnership provision is ultimately approved by the University's Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that:

the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

9. What opportunities are graduates likely to have on completing the course?

The course will provide a comprehensive and integrated understanding/knowledge of entrepreneurship and management with the practical skill set suitable for either business start-up/growth or working in a large organisation as an intrapreneur. Once graduate, many of the students may be able to launch and grow their own businesses or may become actively involved in the management of their family's business. In addition, there is even a possibility to pursue a career as a social entrepreneur or a corporate entrepreneur/intrapreneur to lead and manage a larger organisation in an executive/employee capacity.

COURSE SPECIFICATION



Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Management and Information Systems

Date of first publication/latest revision: July 2018

1. What is the course?

Course information

Course Title	MSc in Management and Information Systems
Course code	MSMGIFTC, MSMGIPTC, PDMGIFTC, PDMGIPTC, PCMGIFTC, PCMGIPTC
Academic Year	2018/19
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time, Part-time
Location(s)¹ of Study	Cranfield University
School(s)	School of Aerospace, Transport and Manufacturing
Theme	Manufacturing
Centre	Sustainable Manufacturing Systems Centre
Course Director	Dr Ip-Shing Fan
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	Not Applicable
Registration Period(s)	Full-time MSc - one year, Part-time MSc - up to three years, Full-time

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

available	PgDip - one year, Part-time PgDip - two years, Full-time PgCert - one year, Part-time PgCert - two years
Course Start Month(s)	Full-time: October. Part-time: throughout the year

Institutions delivering the course

This course is delivered by The School of Aerospace, Transport and Manufacturing, Manufacturing Theme, Sustainable Manufacturing Systems Centre where the research interests include:

- Manufacturing Systems Engineering
- Product-Service Systems
- Supply Chain Management
- Enterprise Scale IT Systems
- Simulation and Modelling
- Innovation Management

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited formally by Institution of Mechanical Engineers (IMechE) up to and including Academic year 2019-20, Institution of Engineering and Technology (IET) up to and including Academic year 2019-20, Royal Aeronautical Society (RAeS) up to and including Academic year 2019-20.

2. What are the aims of the course?

The aim of this course is:

- To provide graduates with knowledge and skills required to enable them to apply management and information systems in an effective way to solve management problems in industrial, commercial and governmental organisations.
- To further develop suitably trained and qualified individuals, and enable them to make an immediate contribution to a company's performance and operation, and to progress into senior management positions.

Cranfield University offers this course in order to:

- Provide graduates with the knowledge and skills necessary to enable them to understand the theories behind the major tools and techniques available for problem solving within Management and Information Systems.
- Equip students to understand the needs addressed by the above tools and techniques.
- Expose students to tools and techniques to identify and analyse management problems, propose solutions and to select and implement a solution to support the business need.
- Develop students' ability to demonstrate, through group project and individual thesis, expertise in solving management problems.

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) exit routes are provided for students who wish to access only parts of the course provided.

This programme is intended for the following range of students:

- Those wishing to work nationally or internationally to practice effective technology enabled management.

- Those wishing to work in information technology solution vendors and implementation consultancy.
- Those wishing to work in the public/government sector on industry competitiveness and productivity issues.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Demonstrate an awareness of the principles and theories behind the major techniques and tools available for problem solving in the areas of Management and Information Systems.
- ILO 2. Critically evaluate the theory behind; and the selection of appropriate analysis, design and development tools and apply them to solve business problems in terms of Information Systems and/or organisations.
- ILO 3. Critically evaluate previous and current research and methodologies, and determine their relevance to a given manufacturing, industrial, business or commercial problem.
- ILO 4. Acquire and use Data, Information and Knowledge effectively, and apply appropriate techniques and tools to identify and analyse management problems and to propose solutions.
- ILO 5. Use independent learning skills to continuously advance their knowledge and understanding of Management and Information Systems.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 6. Demonstrate key management and personal management skills needed to influence and implement change.
- ILO 7. Demonstrate team based project skills to develop IT enabled management solutions (Group project participants only).

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 8. Undertake independent research on a subject relevant to management and information systems involving project planning, development of new skills, critical evaluation of literature, evaluation of results, and discussion of findings and writing a thesis

4. How is the course taught?

The MSc course has three components: taught modules (40%), group projects (20%), and an individual research project (40%). The taught modules are typically delivered in one-week blocks between October and February.

The teaching methods include lectures, case studies, group exercises, field visits, seminars and computer-based demonstrations and exercises. All students attend a week of introductory lectures (given during the first week of the course). Within this induction week, students will be introduced to personal development planning and asked to reflect on their transferable skills and

to take ownership of their personal development during the course. Induction is followed by 8 assessed modules, each module has a one week residential component plus pre-work and post-study.

All MSc students undertake a Group Project (full time students) or produce a Dissertation (part time students). The Group projects are group-based activities typically undertaken for 12 weeks between February and April. The projects are designed to integrate knowledge, understanding and skills from the taught modules in a real-life situation. The Group Project will typically involve a team of between 5 and 8 students, working to investigate a business opportunity or solve a business problem. For part-time students, a Dissertation replaces the Group Project. The topic is to be agreed between the University and the student.

All MSc students will undertake an individual research project (thesis project) under the supervision of a member of academic staff. For the individual research project, each student is allocated a supervisor. Guidance sessions are provided as to what is required from the thesis and oral presentation.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 2, 3, 4 and 6	40
ELECTIVE MODULES:	
Modules 5, 7, 8 and 9 (Select 2)	20
RECOMMENDED MODULE:	
Induction	0
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 2-9	80
Group Project for full-time students (10a) or Dissertation for part-time students (10b)	40

ELECTIVE MODULES:	
None	
RECOMMENDED MODULE:	
Induction	0
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 2-9	80
Group Project for full-time students (10a) or Dissertation for part-time students (10b)	40
Individual Research Project (11)	80
ELECTIVE MODULES:	
None	
RECOMMENDED MODULE:	
Induction	0
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);^{3 4}

³ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in October and are expected to complete the course within 12 calendar months.

This course is also offered on a part-time basis. In such a situation, students typically complete the various components of the course over two or three years. The typical case is to complete four taught modules plus a Dissertation in year 1 and the remainder of the modules plus the Thesis in year two and/or year 3.

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Type of Assessment	Weighting of individual elements of multi-part assessment ⁹ (100%)	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
1	I-MAN-INWK	Induction	Dr Konstantinos Salonitis	22		0	Y		25/09/18	29/09/18	N/A	AO	N/A				N/A	
2	I-MNU-A1031	Enterprise Systems	Dr Essam Shehab	32		10	Y		15/10/18	19/10/18	40	EX	100				wc 10/12/18	September 2019.
3	I-MNU-A1034	Operations Management	Prof Charalampos (Harris)	32		10	Y		01/10/18	05/10/18	40	EX	100				26/10/18	Manufacturing resit exams will be during week

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%. This will be at the Board of Examiners discretion.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
			Makatsoris														commencing TBC	
4	I-MNU-A1074	Business Process Analysis and Engineering	Dr Ip-Shing Fan	32		10	N		29/10/18	02/11/18	40	ICW	100				FT30/11/18 PT14/12/18	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
5	I-MNU-A1018	General Management	Mr Matthew Caffrey	32		10	Y		19/11/18	23/11/18	40	EX	100				Wc 02/01/19	Manufacturing resit exams will be during week commencing TBC
6	I-MNU-A1035	Business Change Management	Dr Ip-Shing Fan	32		10	N		12/11/18	16/11/18	40	ICW	100				FT14/12/18 PT08/01/19	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
7	I-MNU-A1007	Business Data Analytics	Dr Ip-Shing Fan	32		10	N		03/12/18	07/12/18	40	ICW	100				FT11/01/19 PT25/01/19	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
8	I-KME-A1037	Enterprise Modelling	Dr John Ahmet Erkoyuncu	32		10	Y		07/01/19	11/01/19	40			100 MULTI	ICW GCW	60 40	FT01/02/19 PT15/02/19	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
9	I-MNU-A1037	Project and Programme Management	Dr Ip-Shing Fan	32		10	N		21/01/19	25/01/19	40 40			100 MULTI	GCW ICW	30 70	FT08/02/19 PT22/02/19	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
10a	I-MAT-GRPP	Group Project for Full Time Students	Dr David Ayre	20		40	Y		01/02/19	26/04/19				80 MULTI 20 MULTI	GPRES GPROJ ICW observed behaviour	16 64 10 10	08/05/19 30/04/19 30/04/19	
10b	I-MAT-DISS	Dissertation for Part Time Students	Dr Konstantinos Salonitis	20		40	Y		01/02/19	30/08/19		ICW	100				30/08/19	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
11	I-MNU-THESIS	Individual Research Project	Dr Muhammad Khan	20		80	Y		29/04/19	02/09/19		THESIS OR	90 10				30/08/19 02/09/19	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
I-MAN-INWK	Induction	Engineering and Management of Manufacturing Systems	Engineering & Management of Manufacturing Systems, Knowledge Management for Innovation (not currently running), Aerospace Manufacturing, Global Product Development and Management, Cyber-Secure Manufacturing
I-MNU-A1031	Enterprise Systems	Management and Information Systems	Engineering & Management of Manufacturing Systems, Knowledge Management for Innovation (not currently running)
I-MNU-A1034	Operations Management	Engineering and Management of Manufacturing Systems	Manufacturing Technology and Management, Engineering & Management of Manufacturing Systems, Global Product Development and Management, Aerospace Manufacturing, Cyber-Secure Manufacturing
I-MNU-A1018	General Management	Engineering and Management of Manufacturing Systems	Advanced Materials, Applied Nanotechnology, Manufacturing Technology and Management, Global Product Development and Management, Knowledge Management for Innovation (not currently running), Engineering & Management of Manufacturing Systems
I-KME-A1037	Enterprise Modelling	Management and Information Systems	Knowledge Management for Innovation (not currently running), Global Product Development and Management
I-MAT-DISS	Dissertation for Part Time Students	Manufacturing Technology and Materials Programme	Advanced Materials, Aerospace Materials, Applied Nanotechnology, Manufacturing Technology & Management, Aerospace Manufacturing, Engineering & Management of Manufacturing Systems, Knowledge Management for Innovation (not currently running), Global Product Development and Management, Cyber-Secure Manufacturing, Welding Engineering
I-MAT-GRPP	Group Project for Full Time Students	Manufacturing Technology and Materials	Advanced Materials, Aerospace Materials, Applied Nanotechnology, Manufacturing

		Programme	Technology & Management, Engineering & Management of Manufacturing Systems, Knowledge Management for Innovation (not currently running), Aerospace Manufacturing, Global Product Development and Management, Cyber-Secure Manufacturing, Welding Engineering
I-MNU-THESIS	Individual Research Project	Aerospace Manufacturing	Engineering & Management of Manufacturing Systems, Knowledge Management for Innovation (not currently running), Global Product Development and Management, Cyber-Secure Manufacturing, Advanced Materials, Aerospace Materials, Applied Nanotechnology, Manufacturing Technology and Management, Welding Engineering

7. How are the ILOs assessed?

The following assessment types are utilised:

The course uses a range of assessment types. Students can expect to have three written examinations, five pieces of assessment by submitted work, one piece of group project work (including an assessment of personal contribution to group work), and one element assessed by a thesis and an oral presentation.

This approach has been adopted in order to perform formative and summative assessments of the students to demonstrate their ability in a range of contexts. Part time students will be assessed by dissertation in place of the group project.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.
2	EX	EX		EX	EX
3	EX	EX		EX	
4	ICW	ICW		ICW	ICW

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.
5	EX	EX		EX	
6	ICW	ICW	ICW	ICW	ICW
7	ICW	ICW	ICW	ICW	
8	ICW	ICW	ICW	ICW	ICW
9	ICW	ICW	ICW	ICW	ICW

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.
2	EX	EX		EX	EX	EX	
3	EX	EX		EX		EX	
4	ICW	ICW		ICW	ICW	ICW	ICW
5	EX	EX		EX		EX	
6	ICW						
7	ICW	ICW	ICW	ICW		ICW	ICW
8	ICW						
9	ICW						
10a	GPRES GPROJ ICW						
10b	ICW						

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.	ILO.8
2	EX	EX		EX	EX	EX		
3	EX	EX		EX		EX		
4	ICW	ICW		ICW	ICW	ICW	ICW	ICW
5	EX	EX		EX		EX		
6	ICW	ICW						
7	ICW	ICW	ICW	ICW		ICW	ICW	ICW
8	ICW	ICW						

Award ILOs Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.	ILO 8
9	ICW							
10a	GPRES GPROJ ICW							
10b	ICW							
11	THESIS OR							

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review. For collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focussed Review which looks at each course in depth. In addition occasional site inspection visits are made.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

9. What opportunities are graduates likely to have on completing the course?

The intention of the course is to provide students with knowledge and understanding and associated transferrable skills to make a contribution to industry on graduation. Graduates will typically seek employment in IT users and vendors industries, consultancies or research institutions. Common starting roles are junior managers, business analyst, implementation consultant, project manager and PhD researcher. With time (quicker for those with more background experience) graduates progress to senior positions with significant responsibility for people, budgets, and projects.

COURSE SPECIFICATION



Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: July 2018

1. What is the course?

Course information

Course Title	Management and Leadership
Course code	MSMMLPTC
Academic Year	2018/19
Valid entry routes	MSc
Additional exit routes	PgCert in Management and Leadership PgDip in Management and Leadership
Mode of delivery	Part-time
Location(s)¹ of Study	Cranfield University; London (Grant Thornton Premises)
School(s)	School of Management
Theme	Management and Leadership
Centre	Centre for Management
Course Director	Professor Michael Dickmann
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	Not Applicable
Registration Period(s) available	MSc - part-time - maximum of 5 years PG Certificate – 3 years PG Diploma – 4 years
Course Start Month(s)	March and September

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Institutions delivering the course

This course is delivered by the School of Management where the research interests consist of a wide range of management functions.

All teaching and assessment is provided by the School of Management, at times in cooperation with other parts of the university or through external collaborators who have recognised teacher status (RTS). The principal external collaborator is Grant Thornton, one of the major professional service organizations in the UK. Some modules are being taught at the premises of Grant Thornton in London. Grant Thornton's RTS staff also delivers some accounting teaching. In addition, Grant Thornton's accredited coaching will engage with the students and deliver individualized coaching sessions in close alignment with Cranfield and the Leading with Impact: Organizational Behaviour module.

Furthermore, Cranfield University interacts with the following institutions and in the following ways:

- All students will undertake a consulting project, normally in an external organisation, presenting findings to senior managers from the organisation involved
- Each module will incorporate input from senior managers/practitioners where appropriate
- Some students undertake research and/or project work off campus, within organisations. In some cases this may take the form of a short term internship assessed by individual project.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies.

2. What are the aims of the course?

The Cranfield MML aims to provide a distinctive and collaborative learning experience centred on a process of intense, interactive classroom sessions where the combination of the professional experience of a diverse student cohort and the faculty's direct involvement with global businesses ensures graduates have a deep understanding of contemporary business issues and the capacity to assume active leadership roles. This experience is founded on the integration of five aims:

- To develop a group of influential future leaders who will make a significant impact on their organisations, industries and the wider community.
- To create an understanding as to how to develop leadership capabilities in self and others in order to meet modern societal and business challenges.
- To deliver a contemporary and comprehensive knowledge of core business functions enabling students to show leading-edge insights and knowledge to experts and non-experts in a variety of management areas.
- To create a strategic mindset capable of viewing organisations as consisting of functions and groups whose actions must be motivated and aligned to meet objectives.
- To generate the self-awareness and confidence to lead and/or operate effectively as a member of a team drawn from a diverse variety of cultures, business experiences and personalities.

This programme is intended for the following range of students:

- Early-career professionals who want a "real-world" business education which they can apply directly back to their workplace.
- Self-motivated managers who are keen to improve themselves, enhance their skills, knowledge and abilities, and become more effective leaders.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Management and Leadership

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Articulate a critical awareness of the global environment within which organisations operate and the socio-cultural, political, institutional, managerial, technical and ethical ambiguities and risks that this gives rise to.
- ILO 2. Demonstrate appropriate and flexible qualities of leadership. Critically evaluate their personal strengths, weaknesses and preferences when working with others or leading them.
- ILO 3. Exhibit a critical, conceptual understanding of the main areas of management and a systematic knowledge of the relevant literature.
- ILO 4. Critically analyse and creatively manage the career development of themselves and others.

B. Postgraduate Diploma in Management and Leadership

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 5. Evidence the mastery of a wide range of management techniques that successfully address complex problems in a world characterized by high degrees of uncertainty and change. These techniques allow students to identify and analyse business challenges and to develop and implement appropriate solutions. .
- ILO 6. Build strong working relationships as leaders and team members. Demonstrate an ability to work effectively with colleagues through leadership and persuasive influencing skills.

C. Masters in Management and Leadership

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 7. Engage and carry out an evidence-led management project and critically discuss and reflect on it in a substantial project report, developing justified recommendations and action plans.

4. How is the course taught?

Students will be supported in their learning and personal development by:

- Intensive classroom interaction combined with a high proportion of team work, group projects, business simulations and private study.

In addition to the teaching methods outlined above, students will be supported in their learning and personal development by:

- being placed in a diverse learning team and supervised by a learning team tutor;
- being exposed to a range of psychometric tests and an assessment centre exercise;
- one-to-one coaching from professionals.
- peer coaching elements

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

MSc

The accumulation of 200 credits through the assessment of taught modules and the work-based project report as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 1 - 11 Module 12 (attendance only)	130
WORK-BASED PROJECT:	
Report with organizational and reflective learning component	70
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than

- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Part-time students register for the course in September or March and are expected to complete the course within 2 years.

The MML programme comprises a number of residential phases and a work-based project phase. Students start with an orientation day at Cranfield and have, on average, two modules in their block weeks every three months. After 12 modules (the 7th residential week) students embark on a work-based project for which they are supervised by Cranfield academics. After this project which has a minimum duration of 12 weeks the students return to have a last residential phase. This last face-to-face interaction is designed to explore and facilitate the integration of learning, encourages, where possible, the students to share their work-based project experiences (e.g. through a capstone conference) and to help students prepare for their EPAs.

From year 1 of their studies students engage in peer coaching which is complemented by professional coaching sessions in year 2. Throughout their MML degree students are in learning teams to support each other.

30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($< 50\%$).

Course modules – MML March – occurrence J

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Residential ¹ Start Date	Residential ¹ End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module of multi-part assessments ⁸ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessments ⁸	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date	
1	MML/LBO NEW	Leading with Impact: Organisational Behaviour	Dr Richard Kwiatkowski	32		20	N		5/3/19	6/12/19	40			MULTI 100	ICW ICW	50 50	8/11/19 13/01/20	
2	M-T/ECM	Economics for Managers	Prof Catarina Figueira	16		10	Y		5/3/19	8/3/19	40	GCW	100				19/4/19	
3	MML/LSO NEW	Leading Strategic Operations	Dr Abdelkader Aoufi	16		10	N		5/6/19	7/6/19	40	ICW	100				19/7/19	

⁴ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁵ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁶ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%. This will be at the Board of Examiners discretion.

⁷ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁸ For **multi-part assessments** please record the overall weighting of module which should be 100%.

⁹ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹⁰ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Residential ¹ Start Date	Residential ¹ End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module of multi-part assessments ⁸ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessments ⁸	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date	
4	MML/MST NEW	Marketing Strategy	Dennis Esch	16		10	N		3/6/19	5/6/19		ICW	100				19/7/19	
5	MXM/ACT	Accounting	Dr Matthias Nnadi	16		10	Y		9/9/19	12/9/19	40	EX	100				2/12/19	
6	M-T/LCS	Leading Corporate Sustainability	Rosina Watson	16		10	Y		10/9/19	13/9/19	40	ICW	100				25/10/19	
7	MML/SM L NEW	Strategic Management and Leadership	Dr Richard Schoenberg	16		10	N		2/12/19	6/12/19	40 40	GPRES GCW	50 50				17/10/20 17/10/20	
8	MML/ERM NEW	Enterprise, Change and Risk Management	Prof Michael Bourne	16		20	N		02/03/20	12/06/20	40			MULTI 100	GCW ICW	70 30	24/07/20 24/07/20	
9	M-T/MAC	Management Consulting	Dr Monica Franco Santos	16		10	Y		8/6/20	13/6/20	40 40	GPRES ICW	50 50				7/7/20 7/9/20	
10	M-T/DIN	Disruptive Innovation	Dr Leon Williams	16		10	Y		7/9/20	12/9/20	40			MULTI 100	GCW ICW	40 60	24/10/20	
11	M-T/PML	People Management and Leadership	Prof Michael Dickmann	16		10	Y		02/03/20	05/03/20	40	EX	100				08/06/20	
12	M-T/EBMA	Evidence-based Management	Dr Valentina Battista	16		0	Y		7/12/20	12/12/20	N/A	AO	N/A					

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

7

Management and Leadership COURSE SPECIFICATION
QA&E USE ONLY: Version 1 June 2018

Course / SAS Version:

Module Number	Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment						
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates	
												Type of Assessment	Weighting within module of multi-part assessments ⁸ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessments ⁸	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date
13	MML / THS NEW	Management and Leadership Thesis (Work-based project)	Dr Imran Zawwar	10		70	N		02/03/20	12/12/20	50 50	THESIS RP	70 30			1/2/21 1/2/21	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

8

Management and Leadership COURSE SPECIFICATION
QA&E USE ONLY: Version 1 June 2018

Course / SAS Version:

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
M-T/ECM	Economics for Managers	Management	Management and Corporate Sustainability; Management and Leadership
M-T/LCS	Leading Corporate Sustainability	Management	Management and Corporate Sustainability; Management and Leadership
M-T/DIN	Disruptive Innovation	Management	Management and Entrepreneurship; Management and Leadership
M-T/MAC	Management Consulting	Management	Management and Corporate Sustainability; Management and Leadership
M-T/MPL	People Management and Leadership	Management	Management and Corporate Sustainability; Management and Entrepreneurship; Management and Leadership
M-T/EBM	Evidence-based Management	Management	Management and Corporate Sustainability; Management and Entrepreneurship; Management and Leadership; Executive Logistics and Supply Chain Management
MXM/ACT	Accounting	Executive MBA	Management and Leadership

7. How are the ILOs assessed?

The programme uses a range of assessment types. In addition to closed book and open book written examinations, students undertake a wide range of projects. A more unusual type of assessment is the simulation. Here students – again working in teams – might be required to build a warehouse or an electrical product – within a limited period of time, where information may be given and/or changed at intervals. Many projects involve working with a company on a live project. Towards the end of the programme there will be the opportunity for some students to work on company based projects or short term internships, assessed through a written report.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

Award ILOs Module No.	ILO1.	ILO2.	ILO3.	ILO4.	ILO5.	ILO6.	ILO7.
01		Multi	Multi	Multi			
02	GCW						
03	ICW		ICW		ICW		
04	ICW		ICW		ICW		

Award ILOs Module No.	ILO1.	ILO2.	ILO3.	ILO4.	ILO5.	ILO6.	ILO7.
05			EX		EX		
06	ICW	ICW	ICW		ICW	ICW	
07	GPRES/ GCW		GPRES/ GCW		GPRES/ GCW	GPRES/ GCW	
08	Multi		Multi		Multi		
09	GPRES/ CW	GPRES/ ICW	GPRES/ ICW		GPRES/ ICW	GPRES/ CW	
10	Multi	Multi	Multi		Multi	Multi	
11	EX		EX		EX		
12							AO
13 (WBP)	THS		THS		THS	THS	THS

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
Integrated template-based performance and change plan	Enterprise, Change and Risk Management 1 and Enterprise, Change and Risk Management 2	GCW	100

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the expectations and indicators of sound practice of the QAA Quality Code Chapter B10: Managing Higher Education Provision with Others, with regards to the management and operation of the partnership and that the academic standards and the quality of the student experience are assured in line with the remaining chapters of the QAA Quality Code. The delivery of new partnership provision is ultimately approved by the University's Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

9. What opportunities are graduates likely to have on completing the course?

The list of opportunities available to our Masters students after graduating is extremely wide. Drawing on recent surveys of our graduates the most popular functions were as follows:

General Management
Engineering and R & D Management
Consultancy
Business Development
Strategy

Sales/Marketing
Finance/Accounting
Operations
IT Project Management

In addition a small but growing number of students set-up their own businesses, though this number increases after two to three years post-graduation.



COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Manufacturing Technology and Management

Date of first publication/latest revision: July 2018

1. What is the course?

Course information

Course Title	MSc in Manufacturing Technology and Management
Course code	MSMTMFTC, MSMTMPTC, PDMTMFTC, PDMTMPTC, PCMTMFTC, PCMTMPTC
Academic Year	2018/19
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time, Part-time
Location(s)¹ of Study	Cranfield University
School(s)	School of Aerospace, Transport and Manufacturing
Theme	Manufacturing
Centre	Surface Engineering and Nanotechnology Institute
Course Director	Dr Jeff Rao
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Registration Period(s) available	One year full-time, two-five years part-time
Course Start Month(s)	Full-time: October. Part-time: throughout the year

Institutions delivering the course

This course is delivered by the School of Aerospace, Transport and Manufacturing, Manufacturing Theme, where the research interests include Manufacturing Technology and Materials Engineering. Specific areas of expertise include:

Enhanced Composites and Advanced Structures
 Surface Engineering and Precision Engineering
 Welding Engineering and Laser Processing
 Through Life Engineering Services
 Additive Manufacturing

This capability is complemented by the manufacturing management research undertaken through the Manufacturing Theme and the School of Management.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited formally by the Institute of Materials, Minerals and Mining (IOM3) up to and including Academic year 2018-19 also the Institution of Mechanical Engineers (IMechE), Institution of Engineering and Technology (IET) and Royal Aeronautical Society (RAeS) up to and including Academic year 2015-16**.

** Accreditation up to and including Academic year 2019-20 is awaiting review of the output of an accreditation visit.

2. What are the aims of the course?

Cranfield University offers this course in order to:

- Prepare science and engineering graduates to meet the increasing demand of industry, consultancies and the public sector for manufacturing engineers in the aerospace, automotive, health technologies, energy, defense and consumer products sectors.
- Ensure manufacturing engineers acquire an advanced theoretical and specialist understanding of manufacturing technologies, the role of materials and the management of technology in these sectors.
- Enable manufacturing engineers to select and use appropriate technologies in different manufacturing sectors to minimise operational risks and maximise process reliability and capability based on the application of appropriate scientific, technical and engineering principles.
- Ensure manufacturing engineers develop the capacity to undertake successful research and innovation projects using appropriate methods of critical analysis.

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) exit routes are provided for students who wish to access only parts of the course provided.

This programme is intended for the following range of students:

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Manufacturing Technology and Management COURSE SPECIFICATION
 Version 1.0 July 2018

- Graduates with science or related engineering degrees keen to pursue careers in manufacturing.
- Graduates currently in employment keen to extend their qualifications or to pursue a career change.
- Individuals with other qualifications but who possess considerable relevant experience.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Describe the key concepts and issues relating to manufacturing processes, the enabling technologies, together with the engineering principles that underpin the design and operation of manufacturing systems.
- ILO 2. Describe of the influence of materials in manufacturing processes in terms of process reliability, operational risks and system efficiencies
- ILO 3. Analyse manufacturing technology challenges and design appropriate solutions taking account of environmental, technical, regulatory and commercial constraints
- ILO 4. Communicate effectively their work via oral and written presentations and reports.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 5. Demonstrate skills in team working and project management.
- ILO 6. Define, analyse and solve problems faced by manufacturing engineers.
- ILO 7. Apply knowledge to address future manufacturing technology challenges.
- ILO 8. Demonstrate practical skills required within the manufacturing sector.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 9. Identify research problems relevant to appropriate public and private sector organisations, implement a programme of relevant research and collect, analyse and interpret the resultant data to draw appropriate conclusions.

4. How is the course taught?

Students will be supported in their learning and personal development by:

- Comprehensive course materials are provided, as well as a web-site using the Blackboard Virtual Learning Environment (VLE). Students are guided through the use of exercises, group and individual discussion.

- Students engage in class activities to practice the techniques taught.
- Group working is encouraged with the core modules

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 3 and 4	20
ELECTIVE MODULES:	
Four modules from modules 1, 2, 5-17	40
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-4	40
Group Project for full-time students (18a) or Dissertation for part-time students (18b)	40
ELECTIVE MODULES:	
Four modules from modules 5-17	40
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-4	40
Group Project for full-time students (18a) or Dissertation for part-time students (18b)	40
	80

Individual Research Project (19)	
ELECTIVE MODULES:	
Four modules from modules 5-17	40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);^{3 4}
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);

³ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in October and are expected to complete the course within 12 calendar months.

The course also targets part-time candidates and such students are expected to complete the course within 2 to 3 years. Part-time students are not restricted to starting in October. Instead they are offered individual guidance on the best sequence of study based on their prior knowledge and availability to attend.

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of independent assessments	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
1	I-MTM-A2028	Introduction to Manufacturing, Materials and Research Techniques	Dr Sue Impey	25		10	Y		08/10/18	12/10/18	40 40			100 MULTI	GCW GPRES	80 20	FT05/11/18 PT19/11/18	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
2	I-MAT-A1009	Introduction to Materials Engineering	Dr David Ayre	30		10	Y		01/10/18	05/10/18	40	EX	100				wc 10/12/18	Manufacturing resit exams will be during week commencing TBC

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment								
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates			
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date		
3	I-GPD-A1505	Lean Product Development	Dr Ahmed Al-Ashaab	32		10	Y		26/11/18	30/11/18	40	GCW	100					FT04/01/19 PT18/01/19	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
4	I-MNU-A1018	General Management	Mr Matthew Caffrey	32		10	Y		19/11/18	23/11/18	40	EX	100					wc 2/1/19	September 2019
5	I-MAT-A1013	Composites Manufacturing for High Performance Structures	Andrew Mills	35		10	Y		03/12/18	07/12/18	40	ICW	100					FT18/01/19 PT01/02/19	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
6	I-MSN-A1049	Nano and Microscale Rapid Prototyping Manufacture	Dr Paul Jones	28		10	Y		07/01/19	11/01/19	40	ICW	100					FT28/01/19 PT11/02/19	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
7	I-MSN-A1047	Smart Materials	Dr Qi Zhang	27		10	Y		22/10/18	26/10/18	40	ICW	100					FT09/11/18 PT23/11/19	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment								
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates			
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
																	required.		
8	I-MSN-A1068	Nanotechnology	Dr Zhaorong Huang	32		10	N		05/11/18	09/11/18	40	ICW	100					PT07/02/19 FT21/02/19	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
9	I-WEE-A1110	Advanced Welding Processes	Dr Wojciech Suder	32		10	Y		26/11/18	30/11/18	40	EX	100					Wc 04/02/19	September 2019
10	I-MAT-A1011	Additive and Subtractive Manufacturing Technologies	Dr Isidro Durazo-Cardenas	30		10	Y		15/10/18	19/10/18	40			100 MULTI	ICW GPRES	70 30		FT09/11/18 PT23/11/18	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
11	I-MAT-A1016	Surface Science and Engineering	Prof John Nicholls	30		10	Y		21/01/19	25/01/19	40	ICW	100					FT08/02/19 PT22/02/19	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
12	I-UPT-A1186	Functional Coatings and Thin Films	Dr Jose Endrino Armenteros	32		10	Y		21/01/19	25/01/19	40	ICW	100					08/02/19	Re-assessment date to be set by agreement of Course Director and

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date	
																	Module Leader as/when required.	
13	I-MAT-A1014	Finite Element Analysis	Dr Glenn Leighton	35		10	Y		12/11/18	16/11/18	40			100 MULTI	PRES ICW	10 90	16/11/18 FT30/11/18 PT14/12/18	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
14	N-AEN-M	Manufacturing	Dr Kostas Salonitis	32		10	Y		29/10/18	02/11/18	40	ICW	100				TBC.	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
15	I-UPT-A1182	Introduction to Metrology	Dr Saurav Goel	30		10	Y		05/11/18	09/11/18	40	ICW	100				FT07/12/18 PT21/12/18	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
16a	I-MAT-GRPP	Group Project for Full Time Students	Dr David Ayre	20		40	Y		04/02/19	26/04/19				80 MULTI 20 MULTI	GPRES GPROJ ICW observed	16 64 10 10	03/05/19	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment						
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹
													behaviour				
16b	I-MAT-DISS	Dissertation for Part Time Students	Dr Sue Impey/ Dr David Ayre	20		40	Y		04/02/19	30/08/19		ICW	100			30/08/19	
17	I-MNU-THESIS	Individual Research Project	Dr Muhammad Khan	20		80	Y		29/04/19 [†]	02/09/19 [†]		THESIS OR	90 10			02/09/19 [†]	

† Dates for Full time students only. Part time students have flexibility with dates in these components

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
I-MTM-A2028	Introduction to Manufacturing, Materials and Research Techniques	Manufacturing Technology and Management	EngD in Sustainable Manufacturing Systems, MRes in Precision Engineering
I-MAT-A1009	Introduction to Materials Engineering	Advanced Materials	Aerospace Materials, Advanced Materials
I-GPD-A1505	Lean Product Development	Global Product Development and Management	Manufacturing Technology and Management
I-ICI-A1020	Managing Innovation and New Product Development	Innovation and Creativity in Industry	Design and Innovation for Sustainability, Design Strategy and Leadership, Global Product Development and Management, Innovation and Creativity in Industry, Digital Design and Strategic Communication, MRes in Manufacturing
I-MNU-A1018	General Management	Engineering and Management of Manufacturing Systems	Applied Nanotechnology, Global Product Development and Management, Management and Information Systems, Knowledge Management for Innovation (not currently running), Engineering & Management of Manufacturing Systems, Advanced Materials
I-MAT-A1013	Composites Manufacturing for High Performance	Advanced Materials	Aerospace Manufacturing, Aerospace Materials, Advanced Materials, Renewable Energy Marine Structures EngD
I-MSN-A1049	Nano and Microscale Rapid Prototyping Manufacture	Applied Nanotechnology	Applied Nanotechnology
I-MSN-A1047	Nano and Micro Technologies for Energy	Applied Nanotechnology	Applied Nanotechnology
I-MSN-A1068	Nanotechnology	Applied Nanotechnology	Applied Nanotechnology
I-WEE-A1110	Advanced Welding Processing	Welding Engineering	Welding Engineering, Aerospace Manufacturing, Renewable Energy Marine Structures EngD
I-MSN-A1048	Engineering Microdevices	Applied Nanotechnology	Applied Nanotechnology
I-MAT-A1011	Machining, Moulding and Metrology	Advanced Materials	Advance Materials, Aerospace Manufacturing
I-MAT-A1016	Surface Science and Engineering	Advanced Materials	Aerospace Materials, Advanced Materials
I-UPT-A1186	Functional Coatings and Thin Films	Applied Nanotechnology	Applied Nanotechnology

I-MAT-A1014	Finite Element Analysis	Advanced Materials	Advanced Materials, Aerospace Materials, Applied Nanotechnology
I-UPT-A1181	Precision Engineering	Manufacturing Technology and Management	Aerospace Manufacturing
I-UPT-A1182	Metrology and Optical Testing	Manufacturing Technology and Management	MRes in Manufacturing
I-MNU-A1034	Operations Management	Engineering and Management of Manufacturing Systems	Engineering and Management of Manufacturing Systems, Aerospace Manufacturing, Global Product Development and Management, Management and Information Systems, Cyber-Secure Manufacturing
I-MAT-GRPP	Group Project for Full Time Students	Manufacturing Technology and Materials Programme	Advanced Materials, Aerospace Materials, Applied Nanotechnology, Aerospace Manufacturing, Engineering and Management of Manufacturing Systems, Global Product Development and Management, Knowledge Management for Innovation (not currently running), Management and Information Systems, Cyber-Secure Manufacturing, Welding Engineering
I-MAT-DISS	Dissertation for Part Time Students	Manufacturing Technology and Materials Programme	Advanced Materials, Aerospace Materials, Applied Nanotechnology, Aerospace Manufacturing, Engineering and Management of Manufacturing Systems, Global Product Development and Management, Knowledge Management for Innovation (not currently running), Management and Information Systems, Cyber-Secure Manufacturing, Welding Engineering
I-MNU-THESIS	Individual Research Project	Aerospace Manufacturing	Cyber-Secure Manufacturing, Engineering and Management of Manufacturing Systems, Global Product Development and Management, Knowledge Management for Innovation (not currently running), Management and Information Systems, Advanced Materials, Aerospace Materials, Applied Nanotechnology, Welding Engineering

7. How are the ILOs assessed?

The following assessment types are utilised:

The course uses a range of assessment types. Students can expect to have typically 3 written examinations, 5 pieces of assessment by submitted work and several elements of assessment by presentation or viva.

This approach has been adopted in order to ensure that both the fundamental and applied aspects of the course are considered and that the important multi-disciplinary aspects of the subject can be assessed.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO4
1	ICW		ICW	ICW
2	EX		EX	EX
3	GCW	GCW	GCW	GCW
4			EX	EX
5	ICW	ICW	ICW	ICW
6	ICW		ICW	ICW
7	ICW	ICW	ICW	ICW
8				
9	EX	EX	EX	EX
10	ICW	ICW	ICW	ICW
11	ICW GPRES	ICW GPRES	ICW GPRES	ICW GPRES
12	ICW	ICW	ICW	ICW
13	ICW	ICW	ICW	ICW
14	ICW ICW	ICW ICW		ICW ICW
15	ICW	ICW	ICW	ICW
16	EX	EX	EX	EX
17	ICW		ICW	ICW

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 5	ILO 6	ILO 7	ILO 8
1	ICW	ICW	ICW	ICW
2		EX	EX	
3	GCW	GCW	GCW	
4		EX	EX	
5	ICW	ICW	ICW	ICW
6		ICW	ICW	ICW
7		ICW	ICW	
8				
9		EX	EX	EX
10		ICW	ICW	
11		ICW GPRES	ICW GPRES	ICW GPRES
12		ICW	ICW	
13		ICW	ICW	
14		ICW ICW	ICW ICW	
15		ICW	ICW	
16		EX	EX	
17		ICW	ICW	
18a	GPRES GPROJ ICW	GPRES GPROJ ICW	GPRES GPROJ ICW	GPRES GPROJ ICW
18b	ICW	ICW	ICW	ICW

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 9
19	THESIS OR

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review. For collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focussed Review which looks at each course in depth. In addition occasional site inspection visits are made.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

9. What opportunities are graduates likely to have on completing the course?

The Government's manufacturing strategy is focused on high value manufacturing and central to this agenda is the development and application of disruptive technologies that will drive forward the dramatic changes in manufacturing that will take place over the next 15-20 years. This relies on a significant number of highly trained manufacturing engineers who will be essential to provide the leadership necessary to drive UK high value manufacturing forward and provide the vision for

future prosperity. The MSc in Manufacturing Technology and Management is designed to educate manufacturing engineers to ensure they possess the skills needed for the high value manufacturing agenda. SEMTA, the Sector Skills Council for science, engineering and technologies estimates that by 2014 another 33,000 engineers will be required to replace those retiring or leaving the profession and most of these new recruits will be from full time education. The rapid developments in manufacturing technology also dictate that sections of the current workforce will require re-skilling and therefore a significant number of part time students should be attracted to this course whilst remaining in employment.

COURSE SPECIFICATION



Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Medical Technology Regulatory Affairs

Date of first publication/latest revision: February 2018

1. What is the course?

Course information

Course Title	MSc in Medical Technology Regulatory Affairs
Course code	MSMRAPTC, PDMRAPTC, PCMRAPTC
Academic Year	2018/19
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	Not Applicable
Mode of delivery	Part-time
Location(s)¹ of Study	Cranfield University
School(s)	School of Aerospace, Transport and Manufacturing
Theme	Manufacturing
Centre	Sustainable Manufacturing Systems Centre
Course Director	Dr Charles Wainwright
Awarding Body	Cranfield University
Is this an AP Contract course?²	No
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s)	Part-time MSc - up to three years, Part-time PgDip - two years, Part-time PgCert - two years

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

available	
Course Start Month(s)	Throughout the year

Institutions delivering the course

This course is delivered by the School of Aerospace, Transport and Manufacturing, Manufacturing Theme, Sustainable Manufacturing Systems Centre where the research interests include development and implementation of operations management techniques, including regulatory management, within the context of healthcare providers and practitioners.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies.

2. What are the aims of the course?

To equip students with an in-depth understanding of current regulatory issues to support organisations working with all aspects medical devices from design and manufacture through clinical evaluation to operation. In particular, to support the philosophy of process and practice central to medical device regulatory affairs.

This programme is intended for the following range of students:

Graduate professionals working in healthcare regulatory affairs or related areas, who have already gained first-hand practical experience of handling regulatory issues.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Demonstrate a thorough objective appreciation of the complex legislative, regulatory, managerial and commercial pressures and obligations core to medical technology regulation.
- ILO 2. Apply analytical and review skills for regulatory intelligence.
- ILO 3. Apply leadership and management skills in context of regulatory requirements.
- ILO 4. Assess knowledge of regulatory requirements compliance.
- ILO 5. Develop a critical appreciation of the similarities and differences in the regulatory processes undertaken in the Global Environment.
- ILO 6. Develop a critical understanding of the processes required to achieve regulatory approval of a device, including design, evaluation and quality assurance throughout the product life cycle.
- ILO 7. Evaluate the aims, objectives and practical role of medical device regulatory affairs professionals within the wider context of product commercialisation regulatory requirements.
- ILO 8. Employ the practical methods and practices required to practice as a regulatory affairs professional.

ILO 9. Demonstrate an appreciation of the rapid rate of technological change in the healthcare product field and its impact on regulatory requirements.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 10. Collate, analyse and discuss information from a variety of sources.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 11. Demonstrate the ability to apply sound experimental design principles and appropriate research methods to obtain, analyse and evaluate data through the individual research project.

4. How is the course taught?

Students will be supported in their learning and personal development by:

- Use of case studies and class exercises to help develop knowledge and skills in analysis and critical evaluation.
- Use of the Blackboard VLE as a source of information on learning and assessment materials plus routes to additional information and sources of help if required.
- Provision of lectures from external speakers to strengthen teaching in selected areas from academia and industry outside the University's area of expertise.
- Access to library resources, both on-campus and online, which are introduced at the beginning of the course by the Health Information Specialist.
- Focused portfolio tutorial sessions to support the development of information assimilation, written communication and critical evaluation skills.
- Use of an Integrated Portfolio a self-directed activity of reflection and action planning, designed to encourage independent development of transferable skills such as oral presentation, written communication and project management.
- The opportunity to carry out a research project in the student's place of employment to enable practical application of the theory learned during the taught course and development of research skills.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
-------------	---------

COMPULSORY MODULES:	
None	
ELECTIVE MODULES:	
Any 6 modules from 1 - 8	60
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1 - 8	80
Integrating Portfolio (9)	40
ELECTIVE MODULES:	
None	
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1 - 8	80
Integrating Portfolio (9)	40
Individual Research Project (10)	80
ELECTIVE MODULES:	
None	
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout

the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);³

- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

MSc students are expected to complete the course within 36 calendar months. PgDip and PgCert students are expected to complete within 24 months.

Each module is usually taught over 3 days with students typically taking four modules per year.

³ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of $< 40\%$ (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($< 50\%$).

Course modules

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment						
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates	
												Type of Assessment	Weighting within module ⁷ (%) of Independent	Weighting within module of multi-part assessments ⁸ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ⁹	Assessment Submission and/or exam date ¹⁰
1	N-CRE-A1017	Principles of European Medical Technology Regulatory Affairs	Prof Phil Warner	25		10	N		Not running in 2018/19	40	ICW	100					At the next available opportunity which may not be until the course runs the following year
2	N-CRE-A1018	Design, Development and Testing of Medical Devices	Dr Jeff Newman	25		10	N		Not running in 2018/19	40	ICW	100					At the next available opportunity which may not be until

⁴ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁵ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁶ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

⁷ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁸ For **multi-part assessments** please record the overall weighting of module which should be 100%.

⁹ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹⁰ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPAC – Individual Practical; GPAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁷ (%) of Independent	Weighting within module of multi-part assessments ⁸ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ⁹	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date
																	the course runs the following year	
3	N-CRE-A1019	Clinical Evaluation of Medical Devices	Dr Nicola White	25		10	N			Not running in 2018/19	40	ICW	100					At the next available opportunity which may not be until the course runs the following year
4	N-CRE-A1020	Strategic Management of Regulatory Affairs	Dr Charles Wainwright	25		10	N			Not running in 2018/19	40	ICW	100					At the next available opportunity which may not be until the course runs the following year
5	N-CRE-A1021	Medical Technology Vigilance, Post-Market Surveillance and Risk Management	Dr Charles Wainwright	25		10	N		11/09/18	13/09/18	40	ICW	100				29/10/18	At the next available opportunity which may not be until the course runs the following year
6	N-CRE-A1022	Special Topics in Medical Devices in the EU	Prof Phil Warner	25		10	N		20/11/18	22/11/18	40	ICW	100				07/01/19	At the next available opportunity which may not be until the course runs

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁴	Total hours delivered by Visiting Lecturers ⁵	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁶ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁷ (%) of Independent	Weighting within module of multi-part assessments ⁸ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ⁹	Assessment Submission and/or exam date ¹⁰	Assessment / Exam Retake date
																	the following year	
7	N-CRE-A1023	US Regulation of Medical Technology	Dr Charles Wainwright	25		10	N	Not running in 2018/19			40	ICW	100					
8	N-CRE-A1024	Regulatory Strategy through the Product Lifecycle	Dr Charles Wainwright	25		10	N	13/05/19	17/05/19	40	ICW	100					01/07/19	
9	N-CRE-A1028	Integrating portfolio	Prof Phil Warner	24		40	N	Various ¹	Various ²				100 MULTI	RP RP	80 20	Various ³	n/a	
10	N-CRE-A1029	Individual Research Project	Dr Charles Wainwright	25		80	N	7/1/19 Occ A	9/9/19		I PROJ THESIS IPRES	10 80 10				9/9/19	Various ⁴	
								8/7/19 Occ B	6/4/20							6/4/20		

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
N/A			

7. How are the ILOs assessed?

The following assessment types are utilised:

The course uses a range of assessment types by submitted work, which may include oral or written pieces plus a research thesis, and one element of assessment by formal presentation.

This approach has been adopted in order to develop and assess the knowledge and skills required in addition to assessing the student's ability to integrate and apply information in a practical setting.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6	ILO 7	ILO 8	ILO 9
1	ICW	ICW						ICW	ICW
2				ICW		ICW		ICW	ICW
3		ICW		ICW		ICW		ICW	
4	ICW		ICW				ICW	ICW	
5					ICW	ICW	ICW	ICW	
6	ICW		ICW			ICW		ICW	
7	ICW				ICW	ICW		ICW	
8				ICW		ICW	ICW	ICW	

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6	ILO 7	ILO 8	ILO 9	ILO 10
	9	RP								

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6	ILO 7	ILO 8	ILO 9	ILO 10	ILO 11
	10	THESIS IPRES									
10	IPRES										

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
N/A			

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the expectations and indicators of sound practice of the QAA Quality Code Chapter B10: Managing Higher Education Provision with Others, with regards to the management and operation of the partnership and that the academic standards and the quality of the student experience are assured in line with the remaining chapters of the QAA Quality Code. The delivery of new partnership provision is ultimately approved by the University's Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

9. What opportunities are graduates likely to have on completing the course?

It is anticipated that completion of this course will enhance career progression by providing a broader appreciation of the complex regulatory field. As the students taking this course are already in employment, completion of the course is expected to provide formal recognition of the skills and knowledge acquired during the course and in their field of work. Integration of theory and practice is a key objective of the course.



COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Military Aerospace and Airworthiness

Date of first publication/latest revision: June 2018

1. What is the course?

Course information

Course Title	Military Aerospace and Airworthiness
Course code	MSMAAPTR, PDMAAPTR, PCMAAPTR, SPMAAPTR
Academic Year	2018-2019
Valid entry routes	MSc, PgDip, PgCert
Exit routes	MSc, PgDip, PgCert
Mode of delivery	Part-time
Location(s)¹ of Study	Shrivenham and Bedford
School(s)	Cranfield Defence and Security
Theme	N/A
Centre	Centre for Defence Engineering: Aeromechanical Systems
Course Director	Dr John Economou
Awarding Body	Cranfield University
Is this an AP Contract course?²	Yes
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	A first or Second honours degree in a relevant mathematics, science or engineering discipline; additionally an IELTS score of 7.0 is required by students for whom English is not a first language.
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Benchmark Statement(s)	As set out in the Quality Assurance Agency for Higher Education subject benchmark statements for Engineering, Mathematics and Physics at Masters level
Registration Period(s) available	A student who registers for the PgCert will have a registration period of three years. For the PgDip this will be four years, and for the MSc five years.
Course Start Month(s)	September and January

Institutions delivering the course

This course is delivered by Cranfield Defence and Security (Shrivenham Campus) and the School of Aerospace, Transport and Manufacturing (Cranfield Campus).

Cranfield University interacts with the following institutions and in the following ways:

The Military Aerospace and Airworthiness course is delivered through the Defence Academy with the primary customers being the Military Aviation Authority and the Defence Equipment and Support (DE&S) Organisation. The Course Team has worked closely with the customers to ensure that the course meets their educational requirements whilst maintaining the academic standards of the University.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited formally by The Royal Aeronautical Society up to, and including, academic year 2021/22.

2. What are the aims of the course?

The aim of the course is to provide education, on a part-time basis, for employees within the MOD's Defence Equipment and Support agency, the wider MOD, the Armed Forces, and the international defence industry to enable them to work more effectively in the fields of military aerospace technology, airworthiness and safety.

Suitably qualified students, who achieve an acceptable standard on the course, are awarded, as appropriate, either an MSc degree, Postgraduate Diploma (PgDip) or Postgraduate Certificate (PgCert) in Military Aerospace and Airworthiness (MAA) by Cranfield University.

The aims of the PgCert are:

- to provide students with a general understanding of the engineering and management theories, concepts, applications and practices in Military Aerospace and Airworthiness to enable students to relate their knowledge and understanding of Military Aerospace and Airworthiness to the interpretation and analysis of relevant engineering and management information.
- to equip students with the skills necessary to contribute effectively within their own organization and work with their customers and suppliers in the field of Military Aerospace and Airworthiness.

In addition to the PgCert the aims of the PgDip are:

- to provide students with the opportunity to acquire a broader knowledge base and a more holistic understanding of the engineering and management theories, concepts, applications and practices associated with Military Aerospace and Airworthiness than can be achieved at PgCert level.
- to enable students to relate their broader knowledge and understanding of Military Aerospace and Airworthiness to the interpretation and analysis of a more multidisciplinary range of engineering and management information than can be achieved at PgCert level.
- to equip students with the skills necessary to integrate effectively across a wide range of business groups within their own organisation as well as those of their customers and suppliers in the field of Military Aerospace and Airworthiness.

In addition to the PgDip the aims of the MSc are:

- that through the successful completion of a dissertation students will demonstrate independent learning and their ability to describe, analyse and critically review current research and methodologies in Military Aerospace and Airworthiness.
- for students to conduct a piece of original research, through an application of the knowledge, understanding and skills acquired during the taught phase, on a topic relevant to Military Aerospace and Airworthiness.

This programme is intended for the following range of students:

- engineers and scientists within the MOD's Defence Equipment and Support agency, the wider MOD, the Armed Forces, and the international defence industry.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Military Aerospace and Airworthiness

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Identify key theoretical principles, concepts and practices in military aerospace technology, airworthiness and safety
- ILO 2. Critically analyse the design, operation and performance of military aircraft at a level appropriate to airworthiness requirements
- ILO 3. Demonstrate a critical awareness of aviation safety management
- ILO 4. Utilise knowledge, theories and concepts to quantify and critically analyse operational and performance data for selected military aircraft
- ILO 5. Based upon the lessons learned from previous accidents produce reliable, valid and incisive conclusions regarding the key aspects affecting the airworthiness of military aircraft
- ILO 6. Critically evaluate the ways in which aviation safety is quantified and managed

B. Postgraduate Diploma in Military Aerospace and Airworthiness

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 7. Demonstrate knowledge and critical understanding of a broad range of aviation disciplines and their interdependency in the context of military aerospace and airworthiness
- ILO 8. Demonstrate the application of knowledge and understanding in a complex multidisciplinary aerospace technology environment and within an airworthiness context
- ILO 9. Synthesise and critically analyse systems-level military aircraft data

C. MSc in Military Aerospace and Airworthiness

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 10. Identify relevant areas of previous research, placing them in context with a research project and providing critical appraisal
- ILO 11. Critically evaluate facts, concepts, principles and theories and articulate these through reasoned analysis and discussion
- ILO 12. Describe the background to an area of research, justify the research methodologies and discuss the main findings and conclusions in a viva voce examination
- ILO 13. Assess new research ideas, concepts or methodologies through the use of techniques such as experimentation, analytical models and numerical models
- ILO 14. Plan a research project with aims, objectives, risk assessment and time lines (with identification of critical path and contingencies)
- ILO 15. Engage confidently in academic and professional communication, reporting clearly and concisely

4. How is the course taught?

The course is delivered on a part-time modular basis and conforms to the University's system of 10 credits (100 learning hours) per module. It is taught, in general, by conventional means through student attendance of lectures at the Cranfield or Shrivenham campuses. Students will be provided with pre-course and post-course reading and assessment as dictated by the individual course modules. All lecture material, together with a non-assessed online mathematics self-taught module, made available through the CDS VLE (Moodle).

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. **Postgraduate Certificate**

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
00	0
03, 04, 18, 21, 22	50
ELECTIVE MODULES:	
One module to the value of 10 credits chosen from 05-09, 11-17, 23-25	10
TOTAL:	60

AEF³ QUALIFIED CANDIDATES ONLY

Description	Credits
APCL MODULES	
21, 22	20
CORE MODULES:	
00	0
03, 04, 18, 20	40
ELECTIVE MODULES	
N/A	
TOTAL:	60

B. **Postgraduate Diploma**

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
00, 03, 04, 18, 21, 22	0 50
ELECTIVE MODULES:	

³ Aeronautical Engineering Fundamentals (AEF) is a five-week, 20-credit Accredited short course.

Modules to the value of 70 credits chosen from 05-09, 11-17, 23-25	70
TOTAL:	120

AEF³ QUALIFIED CANDIDATES ONLY

Description	Credits
APCL MODULES	
21, 22	20
COMPULSORY MODULES:	
00	0
03, 04, 18, 20	40
ELECTIVE MODULES	
Modules to the value of 60 credits chosen from 05-09, 11-17, 24, 25	60
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
00,	0
03, 04, 18, 21, 22,	50
19	80
ELECTIVE MODULES:	
Modules to the value of 70 credits chosen from 05-09, 11-17, 23-25	70
TOTAL:	200

AEF³ QUALIFIED CANDIDATES ONLY

Description	Credits
APCL MODULES	
21, 22	20
COMPULSORY MODULES:	
00	0
03, 04, 18, 20	40
19	80
ELECTIVE MODULES	
Modules to the value of 60 credits chosen from 05-09, 11-17, 24, 25	60
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);^{4 5}
- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Part-time students register for the course in September or January and are expected to complete the course within 5 years.

Normal entry

The course is offered on a part-time basis only. The PgCert contains five compulsory modules.

⁴ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

⁵ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- MAA03: Airworthiness of Military Aircraft.
- MAA04: Aviation Safety Management.
- MAA18: Safety Assessment of Aircraft Systems.
- MAA21: Fixed-Wing Aeromechanics.
- MAA22: Propulsion Systems.

These provide an overarching introduction to the subject of military aerospace and airworthiness and impart the essential knowledge required by all students on the course. The first three modules cover the underpinning aspects of airworthiness and aviation safety. The latter two modules encompass the core elements of aerospace technology: aerodynamics; propulsion; flight mechanics; structures.

Students then choose one further module to complete the PgCert or a further seven to complete the PgDip (MSc taught phase). This provides the student with the flexibility to tailor their studies to account for prior educational and work experience and the current and future needs of their employment role.

The modules taken in the taught phase of the MSc (the PgDip) provide students with the knowledge and skills necessary to complete a research-based project, which forms the final part of the Masters award. Lecturing staff on both campuses will undertake supervision of research dissertations.

AEF-Qualified Students

Students who have successfully passed the Aeronautical Engineering Fundamentals (AEF) Short Course for Credit may use the 20 credits obtained from that course plus a 10-credit top-up module (MAA20) in lieu of the following three 10-credit MAA modules.

- MAA21: Fixed-Wing Aeromechanics
- MAA22: Propulsion Systems
- MAA23: Rotary-Wing Aeromechanics

In addition, students complete the three compulsory airworthiness and aviation safety modules:

- MAA03: Airworthiness of Military Aircraft
- MAA04: Aviation Safety Management
- MAA18: Safety Assessment of Aircraft Systems

Students then choose a further six modules to complete the PgDip (MSc taught phase) plus a research project, which forms the final part of the Masters award.

Course calendar

This course is offered solely on a part-time basis. Students can join the programme in either September or January. The course timetable enables students to complete the compulsory modules in the first year with either start date. The course duration is expected to be:

Minimum period of registration

- PgCert: One year
- PgDip: One year
- MSc: Two years

Maximum period of registration

- PgCert: Three years
- PgDip: Four years
- MSc: Five years

Course modules

The following modules outline all parts of the programme leading to an MSc. Other awards associated with the course include some or all of these modules.

MAA Module Number	Module code	Title	Module Leader	Contact hours ⁶	Total hours delivered by Visiting Lecturers ⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (e.g. Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module (%) of independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
00	R-MAA-SS	Study Skills and Registration	Dr John Economou	12		0	N	03/09/18 14/01/19	03/09/18 14/01/19	05/09/18 16/01/19	N/A	AO					N/A	
03	R-MAA-AMA	Airworthiness of Military Aircraft	Miss Laura Lacey	30		10	N	11/03/19	08/04/19	12/04/19	50 50	EX ICW	30 70				12/04/19 10/06/19	05/07/19 02/09/19

⁶ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁷ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁸ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

MAA Module Number	Module code	Title	Module Leader	Contact hours ⁶	Total hours delivered by Visiting Lecturers ⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (e.g. Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
04	N-SAI-ISMS	Aviation Safety Management	Dr Simon Mitchell Mr David Barry	30		10	Y	08/04/19	08/04/19	12/04/19	50	ICW	100				10/06/19	AY19/20
05	N-AW-ATEMO	Air Transport Engineering – Maintenance Operations	Dr Cenqiz Turkoglu	30	8	10	Y	11/02/19	11/02/19	15/02/19	40			100	EX ICW	30 70	15/02/19 15/04/19	AY19/20
06	N-HFS-AAI	Aircraft Accident Investigation and Response	Peter McCarthy	30		10	Y	08/04/19	08/04/19	12/04/19	40	ICW	100				10/06/19	AY19/20
07	R-MAA-AS	Aircraft Survivability	Mr Ioannis Vagias	35		10	N	04/03/19	04/03/19	08/03/19	40	ICW	100				13/05/19	AY19/20
08	N-AW-ICAS	Design Durability and Integrity of Composite Aircraft Structures	Prof Phil Irving	35		10	Y	08/07/19	08/07/19	12/07/19	40	ICW	100				09/09/19	AY19/20
09	N-AW-FAEC	Fundamentals of Aircraft Engine Control	Dr Theoklis Nikolaidis	30		10	Y	11/03/19	11/03/19	15/03/19	40	ICW	100				13/05/19	AY19/20

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

MAA Module Number	Module code	Title	Module Leader	Contact hours ⁶	Total hours delivered by Visiting Lecturers ⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (e.g. Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
11	R-MAA-GW	Guided Weapons	Dr Derek Bray	32		10	Y	14/01/19	14/01/19	18/01/19	40	ICW	100				18/03/19	AY19/20
12	N-AEN-ASC	Introduction to Aircraft Structural Crashworthiness	Dr Hessam Ghasemnejad	25		10	Y	01/07/19	01/07/19	05/07/19	40	ICW	100				02/09/19	AY19/20
13	R-MAA-IHF	Introduction to Human Factors	Ms Rebecca McKeown	40		10	N	20/05/19	20/05/19	24/05/19	40 40	GPRAC ICW	20 80				24/05/19 22/07/19	AY19/20 AY19/20
14	N-AW-MIGT	Mechanical Integrity of Gas Turbines	Dr Panagiotis Laskaridis	30		10	Y	29/04/19	29/04/19	03/05/19	40	ICW	100				24/06/19	AY19/20
15	R-MAA-MAS	Military Aircraft Systems	Dr John Economou	35		10	Y	03/06/19	03/06/19	07/06/19	40 40	EX ICW	50 50				08/07/19 05/08/19	AY19/20 AY19/20
16	R-MAA-MA	Military Avionics – STA, Communications and Navigation	Dr Alessio Balleri	32		10	N	21/01/19	21/01/19	25/01/19	40	ICW	100				25/03/19	AY19/20
17	N-AW-RA	Practical Reliability	Dr Simon Place	30	10	10	Y	15/10/18	15/10/18	19/10/18	40	ICW	100				17/12/18	AY19/20

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

MAA Module Number	Module code	Title	Module Leader	Contact hours ⁶	Total hours delivered by Visiting Lecturers ⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (e.g. Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
18	N-AW-SAAS	Safety Assessment of Aircraft Systems	Dr Simon Place	35	12	10	Y	24/06/19	24/06/19	28/06/19	50			100	ICW GPRES	70 30	27/08/19 28/06/19	AY19/20 AY19/20
19	R-MAA-DISS	Research Project	Dr Alistair Saddington	20		80	N	01/09/18	01/09/18	01/09/19	50	THESIS OR	80 20				01/09/19	The following academic year
20	R-MAA-FAE	AEF Top-Up	Prof Kevin Knowles	6		10	N	06/09/18	06/09/18	06/09/18	50	ICW	100				02/11/18	AY19-20
21	R-MAA-FWA	Fixed-Wing Aeromechanics	Prof Kevin Knowles	33		10	N	01/10/18	01/10/18	05/10/18	50 50	EX ICW	50 50				12/11/18 03/12/18	AY19/20 AY19/20
22	R-MAA-PS	Propulsion Systems	Dr Alistair Saddington	28		10	N	03/12/18	03/12/18	07/12/18	50 50	EX ICW	50 50				14/01/19 04/02/19	AY19/20 AY19/20
23	R-MAA-RWA	Rotary-Wing Aeromechanics	Prof Kevin Knowles	30		10	N	05/11/18	05/11/18	09/11/18	40 40	EX ICW	50 50				10/12/18 07/01/19	AY19/20 AY19/20

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

MAA Module Number	Module code	Title	Module Leader	Contact hours ⁶	Total hours delivered by Visiting Lecturers ⁷	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (e.g. Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁸ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module (%) of Independent	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
24	N-AW-AFDT	Aircraft Fatigue and Damage Tolerance	Dr Wenli Liu	30		10	Y	10/06/19	10/06/19	14/06/19	40	ICW	100				12/08/19	AY19/20
25	N-HFS-HFAM	Human Factors in Aviation Maintenance	Dr Cenqiz Turkoglu Dr H Rashid	30		10	Y	18/03/19	18/03/19	22/03/19	40 40	ICW GPRES	90 10				20/05/19 22/03/19	AY19/20 AY19/20

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
N-SAI-ISMS	MAA04: Aviation Safety Management	Safety and Human Factors in Aviation	<ul style="list-style-type: none"> • Airworthiness • Air Transport Management • Safety and Accident Investigation (Air Transport) • Military Aerospace and Airworthiness
N-AW-ATEMO	MAA05: Air Transport Engineering – Maintenance Operations	Airworthiness	<ul style="list-style-type: none"> • Air Transport Management • Military Aerospace and Airworthiness
N-HFS-AAI	MAA06: Aircraft Accident Investigation and Response	Safety and Human Factors in Aviation	<ul style="list-style-type: none"> • Airworthiness • Forensic Engineering and Science • Military Aerospace and Airworthiness
N-AW-ICAS	MAA08: Design Durability and Integrity of Composite	Aircraft Engineering	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness • Airworthiness • Advanced Materials
N-AW-FAEC	MAA09: Fundamentals of Aircraft Engine Control	Airworthiness	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness • Thermal Power
N-AEN-ASC	MAA12: Introduction to Aircraft Structural Crashworthiness	Aircraft Engineering	<ul style="list-style-type: none"> • Airworthiness • Military Aerospace and Airworthiness • Safety and Accident Investigation
N-AW-MIGT	MAA14: Mechanical Integrity of Gas Turbines	Airworthiness	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness
N-AW-RA	MAA17: Practical Reliability	Airworthiness	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness
N-AW-SAAS	MAA18: Safety Assessment of Aircraft Systems	Airworthiness	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness • Safety and Accident Investigation (Air Transport)
N-HFS-AFDT	MAA24: Aircraft Fatigue and Damage Tolerance	Airworthiness	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness
N-HFS-HFAM	MAA25: Human Factors in Aircraft	Safety and Human Factors	<ul style="list-style-type: none"> • Military Aerospace and Airworthiness

	Maintenance	in Aviation	<ul style="list-style-type: none"> • Safety and Accident Investigation (Air Transport)
R-MAA-GW	MAA11: Guided Weapons	Military Aerospace and Airworthiness	<ul style="list-style-type: none"> • Military Vehicle Technology and Gun Systems Design
R-MAA-MAS	MAA15: Military Aircraft Systems	Military Aerospace and Airworthiness	<ul style="list-style-type: none"> • Airworthiness

7. How are the ILOs assessed?

The following assessment types are utilised:

The assessment of candidates is based upon a combination of examinations, coursework assignments, and, for masters' course students, a research-based dissertation and a viva voce examination. Details of the precise methods of assessment for each module are included in the Module Descriptors and are summarized in the Course Specification.

The PgCert uses a mixture of written examinations and coursework assignments, which are designed to assess the understanding and application of the core elements of aerospace engineering and airworthiness.

In the PgDip the emphasis is on developing the understanding over a broader range of topics and to a greater depth of analysis. Students are encouraged to adopt a more holistic approach to their understanding and application of the engineering and management theories, concepts, applications and practices associated with military aerospace and airworthiness. Assessment methods include written examinations, technical essays and reports, analytical work, computer-based exercises and group activities.

To complete the course to the award of an MSc qualification, students must complete a research-based project. The project is assessed through a combination of an examination of the student's written dissertation and a viva voce examination. Suggestions for projects may come from a variety of sources: an individual student's sponsor, a member of the Cranfield academic staff, or the wider aerospace community, for example.

The project may be conducted at the student's place of work under the day-to-day supervision of their employer and the overall supervision of one or more members of the Cranfield academic staff.

This approach has been adopted because it provides a balanced approach to the overall course assessment.

Assessment and ILO Mapping

A. Postgraduate Certificate

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
00						
03	EX/ICW				ICW	
04	ICW		ICW			
18	ICW					ICW
21	EX/ICW	ICW		EX/ICW		
22	EX/ICW	ICW		EX/ICW		

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 7	ILO 8	ILO 9
Dependent upon electives chosen	The ILOs achieved over and above those of the PgCert are based upon a more comprehensive, holistic, and systems-level understanding of the military aerospace, airworthiness and safety disciplines		

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 10	ILO 11	ILO 12	ILO 13	ILO 14	ILO 15
19	THESIS OR	THESIS OR	OR	THESIS	THESIS	THESIS OR

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the expectations and indicators of sound practice of the QAA Quality Code Chapter B10:

Managing Higher Education Provision with Others, with regards to the management and operation of the partnership and that the academic standards and the quality of the student experience are assured in line with the remaining chapters of the QAA Quality Code. The delivery of new partnership provision is ultimately approved by the University's Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

9. What opportunities are graduates likely to have on completing the course?

The course will equip graduates with the knowledge and skills necessary for them to work effectively within MOD and the defence industry in areas of military aerospace technology, airworthiness and safety. This will open up opportunities to work in integrated project teams on matters of equipment procurement, support and maintenance and contribute effectively with customers and suppliers. In addition, the qualification obtained will support their professional development towards Incorporated or Chartered Engineer status. The students on the course are all employed in the defence sector and are generally taking the course as CPD.



COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Military Electronic Systems Engineering

Date of first publication/latest revision: 03/09/2018

1. What is the course?

Course information

Course Title	Military Electronic Systems Engineering Including: Communications Electronic Warfare PgCert Sensors Electronic Warfare PgCert
Course code	MSMESFTR, PDMESFTR, MSMESPTR, PDMESPTR – PCCEWPTR – PCSEWPTR - SPMESPTR
Academic Year	2018/2019
Valid entry routes	MSc, PgDip, PgCert
Additional Exit routes	PgDip, PgCert
Mode of delivery	Full-time and Part-time
Location(s)¹ of Study	Shrivenham
School(s)	Cranfield Defence and Security
Theme	Defence and Security
Centre	Electronic Warfare and Information Centre (EWIC)
Course Director	Dr David James
Awarding Body	Cranfield University
Is this an AP Contract course?²	Yes
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	N/A

¹ If any part of this course is delivered at another site, please note which one(s) here

² AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Registration Period(s) available	Full time registration is for 1 year A part time student who registers for the PgCert will have a registration period of 3 years. For the PgDip this will be 4 years, and for the MSc 5 years.
Course Start Month(s)	September

Institutions delivering the course

This course is delivered by School of Defence and Security and largely by staff within the Electronic Warfare Centre, where the research interests include electro-magnetic systems and devices, radar systems and radar development, communications principles and networks, electro-optics including seekers, laser systems and image processing.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies.

2. What are the aims of the course?

Cranfield University offers this MSc course in order to provide education and training in selected electronic military systems. The main object of the course is to bring together the wide variety of disciplines involved and present them in an integrated manner, emphasising the system aspects.

The formal aims of the course are as follows:

- The aim of the Postgraduate Certificates is to provide students with a detailed knowledge and understanding of either military communications or sensors systems with particular regard to electronic warfare.
- The aim of the Postgraduate Diploma course is to provide students with a detailed knowledge and understanding of military electronic warfare systems consisting of both communications and sensor systems.
- In addition, the MSc course enables the student to carry out an in-depth investigation into an area of electronic warfare to further enhance their analytical capability.
- Successful graduates of this course should be fully equipped for roles in defence intelligence, systems development and acquisition, involving the specification and analysis of such systems.

This programme is intended for the following range of students:

Officers of the armed forces and for scientists and technical officers in government defence establishments and the defence or related industry. It is particularly suitable for those who, in their subsequent careers, will be involved with the specification, analysis, development, technical management or operation of military radar, electro optics, communications, sonar or information systems, where the emphasis is on an electronic warfare environment.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Communications Electronic Warfare

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Critically analyse the threat from Electronic Surveillance (ES) and Electronic Attack (EA) to typical military information systems
- ILO 2. Propose strategies involving Electronic Defence (ED) mechanisms to such threats
- ILO 3. Investigate and evaluate current and proposed ED methods and techniques to the threats previously defined
- ILO 4. Evaluate the performance of a number of military information systems given a system description and relate this performance to the original specification
- ILO 5. Assess quantitatively the performance of such systems in a hostile EW environment

B. Postgraduate Certificate in Sensors Electronic Warfare

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 6. Critically analyse the threat from Electronic Surveillance (ES) and Electronic Attack (EA) to typical military sensor systems
- ILO 7. Propose strategies involving Electronic Defence (ED) mechanisms to such threats
- ILO 8. Investigate and evaluate current and proposed ED methods and techniques to the threats previously defined
- ILO 9. Evaluate the performance of a number of military sensor systems given a system description and relate this performance to the original specification
- ILO 10. Assess quantitatively the performance of such systems in a hostile EW environment

C. Postgraduate Diploma in Military Electronic Systems Engineering

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 11. Critically analyse the threat from Electronic Surveillance (ES) and Electronic Attack (EA) to typical military sensor and information systems. Specifically, the systems include radar, sonar, electro-optic and infrared sensors, communications systems and networks, communications and non-communications EW systems
- ILO 12. Propose strategies involving Electronic Defence (ED) mechanisms to such threats
- ILO 13. Investigate and evaluate current and proposed ED methods and techniques to the threats previously defined
- ILO 14. Evaluate the performance of a number of military sensor and information systems given a system description and relate this performance to the original specification

ILO 15. Assess quantitatively the performance of such systems in a hostile EW environment

ILO 16. Specify a system from those listed that will meet a detailed operational requirement analyse the performance of various ED mechanisms against defined levels of EA and ES

D. MSc in Military Electronic Systems Engineering

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 17. Implement and document an extended research project in the field of EW requiring elements of information retrieval, modelling, experimentation and theoretical analysis

ILO 18. Implement and employ research methodology in an extended investigation based on recognised project management principles

4. How is the course taught?

The course is taught through lectures, tutorials and demonstrations where appropriate.

In addition to the teaching methods outlined above, students will be supported in their learning and personal development by:

- individual tutorials where necessary and practical
- group tutorials where necessary and practical

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate in Communications Electronic Warfare

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
1 Electromagnetic Propagation and Devices	10
2 Signal Processing, Statistics and Analysis	10
3 Communications Principles	10
4 Communications Systems	10
11 Information Networks	10
14 Communications Electronic Warfare	10

ELECTIVE MODULES:	
N/A	
TOTAL:	60

B. Postgraduate Certificate in Sensors Electronic Warfare

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
1 Electromagnetic Propagation and Devices	10
2 Signal Processing, Statistics and Analysis	10
5 Radar Principles	10
6 Radar Electronic Warfare	10
7 Electro-optics and Infrared Systems 1	10
8 Electro-optics and Infrared Systems 2	10
ELECTIVE MODULES:	
N/A	
TOTAL:	60

C. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
1 Electromagnetic Propagation and Devices	10
2 Signal Processing, Statistics and Analysis	10
3 Communications Principles	10
4 Communications Systems	10
5 Radar Principles	10
7 Electro-optics and Infrared Systems 1	10
ELECTIVE MODULES:	
Modules to the value of 60 credits selected from:	
6 Radar Electronic Warfare	10
8 Electro-optics and Infrared Systems 2	10
9 Advanced Sensor Data Processing	10
10 Advanced Radar	10
11 Information Networks	10
13 Foundations of Modelling and Simulation	10
14 Communications Electronic Warfare	10
TOTAL:	120

D. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
1 Electromagnetic Propagation and Devices	10
2 Signal Processing, Statistics and Analysis	10
3 Communications Principles	10
4 Communications Systems	10
5 Radar Principles	10
7 Electro-optics and Infrared Systems 1	10
12. Project	80
ELECTIVE MODULES:	
Modules to the value of 60 credits selected from:	
6 Radar Electronic Warfare	10
8 Electro-optics and Infrared Systems 2	10
9 Advanced Sensor Data Processing	10
10 Advanced Radar	10
11 Information Networks	10
13 Foundations of Modelling and Simulation	10
14 Communications Electronic Warfare	10
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of $\geq 50\%$;
- An average mark of $\geq 50\%$ across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);^{3 4}

³ For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

⁴ Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a

- **For Taught Assessments**, the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
 - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of $\geq 50\%$ across the taught assessments);
 - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
 - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥ 40 credits, which are not part of the taught assessment average), the pass mark of $\geq 50\%$ (where they exist);
- **For the thesis**, a mark of $\geq 50\%$ in order to receive a pass (where it exists).

6. How is the course structured?

Students register for the course in September and are expected to complete the full time MSc within 48 weeks and the PgDip within 40 weeks.

This course is also offered on a part-time basis. Students would instead be permitted a maximum of 5 years to complete the MSc, 4 years to complete the Diploma and 3 years to complete the Certificate.

Each module is taught over one week, but includes a week preparation time and will be followed by a week of consolidation / coursework. The weeks preceding and following the taught week are normally free of structured teaching.

student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award ($< 50\%$).

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment		Submission dates		
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
1	R-MES-EPD	Electromagnetic Propagation and Devices	Dr I L Morrow	45	0	10	N	03/09/18	03/09/18	14/09/18	50	ICW	100				12/10/18 (FT & PT)	TBC
2	R-MES-SPSA	Signal Processing, Statistics and Analysis	Dr P Barker	30	0	10	Y	01/10/18	01/10/18	05/10/18	50			100	ICW ICW	50 50	02/11/18 (FT & PT) 02/11/18 (FT & PT)	TBC

⁵ Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

⁶ Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

⁷ A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is $\geq 50\%$. This will be at the Board of Examiners discretion.

⁸ For **independent assessments** please record type and weighting of each separate piece of assessment individually.

⁹ For **multi-part assessments** please record the overall weighting of module which should be 100%.

¹⁰ Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.

¹¹ Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis SUP – Supervisor's assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
3	R-MES-CP	Communication Principles	Dr P Barker	30	0	10	N	05/11/18	05/11/18	09/11/18	50			100	ICW	60	07/12/18 (FT & PT)	TBC
															ICW	40	07/12/18 (FT & PT)	TBC
4	R-MES-CS	Communication Systems	Dr Taufiq Asyhari	30	0	10	N	19/11/18	19/11/18	23/11/18	50	ICW	100				21/12/18 (FT & PT)	TBC
5	R-MES-RP	Radar Principles	Dr A Balleri	30	0	10	Y	15/10/18	15/10/18	19/10/18	50	ICW	100				16/11/18 (FT & PT)	TBC
13	R-AMOR-FMS Occ B	Foundations of Modelling and Simulation	Mr J Hoggard	30	0	10	Y	21/01/19	21/01/19	25/01/19	40	ICW	100				04/03/19 (FT & PT)	TBC
6	R-MES-REW	Radar Electronic Warfare	Mr I Vagias	30	0	10	Y	04/02/19	04/02/19	08/02/19	50	ICW	100				08/03/19 (FT & PT)	TBC
7	R-MES-EOIS1	Electro-optics and Infrared Systems I	Dr D B James	32	0	10	Y	03/12/18	03/12/18	07/12/18	50	EX	100				19/12/18 (FT & PT)	18/03/19
8	R-MES-EOIS2	Electro-optics and Infrared Systems II	Dr D B James	32	0	10	Y	07/01/19	07/01/19	11/01/19	50	ICW	100				08/02/19 (FT & PT)	TBC
9	R-MES-ASDP	Advanced Sensor Data Processing	Dr V S Sastry	30	0	10	N	11/03/19	11/03/19	15/03/19	40			100	ICW	60	12/04/19 (FT & PT)	TBC
															ICW	40	12/04/19 (FT & PT)	TBC

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis SUP – Supervisor's assessment

Module Number	Module code	Title	Module Leader	Contact hours ⁵	Total hours delivered by Visiting Lecturers ⁶	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark ⁷ - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module ⁸ (%) of Independent assessments	Weighting within module of multi-part assessments ⁹ (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment ¹⁰	Assessment Submission and/or exam date ¹¹	Assessment / Exam Retake date
14	R-MES-CEW	Communications Electronic Warfare	Dr P Barker	30	0	10	N	11/02/19	11/02/19	15/02/19	50	ICW	100				25/03/19 (FT & PT)	TBC
10	R-MES-AR	Advanced Radar	Dr D Andre	30	0	10	N	25/02/19	25/02/19	01/03/19	40			100	ICW	60	29/03/19 (FT & PT)	TBC
														ICW	40		29/03/19 (FT & PT)	TBC
11	R-MES-IN	Information Networks	Dr P Nobles	30	0	10	N	04/03/19	04/03/19	08/03/19	40	ICW	100				05/04/19 (FT & PT)	TBC
12	R-MES-DISS	Project	Dr D B James	50	0	80	N	06/05/19 (FT)	06/05/19 (FT)	23/07/19 (FT)	50			100	THESIS SUP OR	50 25 25	10/07/19 23/07/19 23/07/19 (FT & PT)	
								03/09/18 (PT)	03/09/18 (PT)	23/07/19 (PT)								

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRACT – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis SUP – Supervisor's assessment

	MODULE	PgCert CEW	PgCert SEW	PgDip MESE	MSc MESE		Marketed as short course	Joint with another MSc
1	EPD	C	C	C	C		NO	
2	SPSA	C	C	C	C		YES	GWS
3	CP	C		C	C		YES	
4	CS	C		C	C		YES	
5	RP		C	C	C		YES	GWS
6	REW		C	E	E		YES	GWS
7	EOIS1		C	C	C		YES	GWS
8	EOIS2		C	E	E		YES	GWS
9	ASDP			E	E		YES	
10	AR			E	E		YES	
11	IN	C		E	E		YES	
12	DIS				C		NO	
13	FMS			E	E		SHARED	AMOR (DSM)
14	CEW	C		E	E		YES	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis SUP – Supervisor’s assessment

Please list all modules that are used by another existing course.

<u>Module code</u>	<u>Module title</u>	<u>Course that owns the module</u>	<u>Other course(s)/ programme(s) that use the module</u>
R-MES-EOIS1	Electro-optics & Infrared Systems I	Military Electronic Systems Engineering	Guided Weapon Systems
R-MES-EOIS2	Electro-optics & Infrared Systems II	Military Electronic Systems Engineering	Guided Weapon Systems
R-MES-RP	Radar Principles	Military Electronic Systems Engineering	Guided Weapon Systems
R-MES-REW	Radar Electronic Warfare	Military Electronic Systems Engineering	Guided Weapon Systems
R-MES-SPSA	Signal Processing, Statistics and Analysis	Military Electronic Systems Engineering	Guided Weapon Systems
R-AMOR-FMS	Foundations of Modelling and Simulation	Applied Mathematics and Operational Research	Military Electronic Systems Engineering

7. How are the ILOs assessed?

The course uses a range of assessment types. Students can expect to have written examinations, pieces of assessment by submitted work and project assessment by written work, presentation and viva.

This approach has been adopted in order to best suit the nature of the individual modules and their content.

Assessment and ILO Mapping

A. Postgraduate Certificate in Communications Electronic Warfare

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5
1	ICW				
2		ICW	ICW	ICW	ICW
3	ICW	ICW		ICW	
4	ICW	ICW	ICW	ICW	
11	ICW		ICW	ICW	ICW
14		ICW	ICW	ICW	ICW

B. Postgraduate Certificate in Sensors Electronic Warfare

Award ILOs Module No.	ILO 6	ILO 7	ILO 8	ILO 9	ILO 10
1	ICW				
2		ICW	ICW	ICW	ICW
5		ICW	ICW	ICW	ICW
6		ICW	ICW	ICW	ICW
7	EX	EX	EX	EX	EX
8	ICW	ICW	ICW	ICW	ICW

C. Postgraduate Diploma in Military Electronic Systems Engineering

Award ILOs Module No.	ILO 11	ILO12	ILO 13	ILO 14	ILO 15	ILO16
9	ICW	ICW	ICW	ICW	ICW	ICW
10	ICW	ICW	ICW	ICW	ICW	ICW
13	ICW	ICW	ICW	ICW	ICW	ICW

D. MSc in Military Electronic Systems Engineering

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	ILO 17	ILO 18
9	ICW	ICW
12	THESIS SUP OR	THESIS SUP OR

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of

professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the expectations and indicators of sound practice of the QAA Quality Code Chapter B10: Managing Higher Education Provision with Others, with regards to the management and operation of the partnership and that the academic standards and the quality of the

student experience are assured in line with the remaining chapters of the QAA Quality Code. The delivery of new partnership provision is ultimately approved by the University's Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

9. What opportunities are graduates likely to have on completing the course?

Successful graduates of this course should be fully equipped for roles in defence intelligence, systems development and acquisition, involving the specification and analysis of such systems, working individually or as part of a team either in the military or in the defence industry.