General Regulations for Higher Degrees in the Faculty of Engineering and Regulations for Doctoral Training Centres in the Faculty of Engineering

The content of our courses is reviewed annually to make sure it is up-to-date and relevant. Individual modules are occasionally updated or withdrawn. This is in response to discoveries through our world-leading research; funding changes; professional accreditation requirements; student or employer feedback; outcomes of reviews; and variations in staff or student numbers. In the event of any change the University will consult and inform students in good time and will take reasonable steps to minimise disruption.

REGULATIONS FOR DOCTORAL TRAINING CENTRES IN THE FACULTY OF ENGINEERING

Regulations are presented in course code order. An alphabetical index of course titles is as follows:

MATR107	Advanced Biomedical Materials	PhD
DENR89	Advanced Biomedical Materials	PhD
EEER07	Advanced Metallic Systems	EngD with Integrated PGDip
MATR50	Advanced Metallic Systems	PhD
MATR56	Advanced Metallic Systems	EngD
MATR145	Advanced Metallic Systems	PhD with Integrated PGDip
MATR146	Advanced Metallic Systems	EngD with Integrated PGDip
MECR104	Advanced Metallic Systems	EngD
MECR114	Advanced Metallic Systems	EngD with Integrated PGDip
EEER84	Compound Semiconductor Manufacturing	PhD
MGTR103	Compound Semiconductor Manufacturing	PhD
CPER05	Energy Storage And Its Applications	PhD
CIVR100	Energy Storage And Its Applications	PhD
EEER100	Energy Storage And Its Applications	PhD
MATR100	Energy Storage And Its Applications	PhD
MECR49	Green Industrial Futures	PhD
MECR50	Green Industrial Futures	EngD
MGTR102	Green Industrial Futures	PhD
MACR046	Green Industrial Futures	PhD
MACR047	Green Industrial Futures	EngD
MATR143	Growing Skills for Reliable Energy from Nuclear (GREEN)	PhD with Integrated PGDip
CPER105	Growing Skills for Reliable Energy from Nuclear (GREEN)	PhD with Integrated PGDip
MECR07	Integrated Tribology (iTCDT)	PhD
MECR80	Machining Science	EngD
ACSR80	Machining Science	EngD
MATR80	Machining Science	EngD
CPER97	Machining Science	EngD
MECR09	Machining Science	PhD
MECR91	Machining Science	PhD
MACR049	MADE4Manufacturing	PhD
MACR050	MADE4Manufacturing	EngD
COMR84	MADE4Manufacturing	PhD
MECR103	Offshore Renewable Energy (AURA)	PhD
MGTR91	Offshore Renewable Energy (AURA)	PhD
MACR051	Offshore Wind Energy Sustainability and Resilience (AURA II)	PhD
MACR052	Offshore Wind Energy Sustainability and Resilience (AURA II)	EngD
MECR92	Resilient Decarbonised Fuel Energy Systems	PhD
MECR93	Resilient Decarbonised Fuel Energy Systems	EngD
CPER107	Resilient Decarbonised Fuel Energy Systems	PhD
MATR110	Resilient Decarbonised Fuel Energy Systems	PhD
MGTR101	Resilient Decarbonised Fuel Energy Systems	PhD
CPER200	Skills and Training Underpinning a Renaissance in Nuclear	PhD
MATR82	Skills and Training Underpinning a Renaissance in Nuclear	PhD
CMBR011	Skills and Training Underpinning a Renaissance in Nuclear	PhD
COMR191	Speech and Language Technologies	PhD with Integrated PGDip
HCSR42	Speech and Language Technologies	PhD with Integrated PGDip
CIVR103	Water Infrastructure and Resilience (WIRe)	PhD FT

CIVR104	Water Infrastructure and Resilience (WIRe)	PhD PT
MECR48	Water Infrastructure and Resilience (WIRe)	PhD
ACSR96	Water Infrastructure and Resilience (WIRe)	PhD
MACR002	Water Infrastructure and Resilience (WIRe)	PhD
MACR003	Water Infrastructure and Resilience (WIRe)	PhD
ELER005	Water Infrastructure and Resilience (WIRe)	PhD
CMBR053	Water Infrastructure and Resilience (WIRe)	PhD
MGTR37	Water Infrastructure and Resilience (WIRe)	PhD
COMR301	White Rose DTP	PhD
COMR302	White Rose DTP	PhD with Integrated PGCert
CMBR003	Yorkshire Bioscience DLA	PhD

CIVR103/CIVR104/MECR48/ACSR96/MACR002/MACR003/ELER005/CMBR053/MGTR37 WATER INFRASTRUCTURE AND RESILIENCE (WIRe) (PhD) (Full-Time/Part Time) (CDT)

(Joint Programme with The University of Cranfield and the University of Newcastle)

For students with initial registration from 2019/20 – 2023/24.

1. In Year One a student will take 40 credits of CDT-specific training, comprising three technical modules and attendance at the CDT Summer School, each of which comprise 10 credits.

2. In each of Years Two and Three a student will take 10 credits of CDT-specific training, comprising attendance at the annual CDT Summer School.

3. By the end of Year Three a student will accrue an additional 20 credits via completion of two technical modules, each of which comprise 10 credits.

4. In Years One to Four a student will also pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those Regulations, with the following exceptions:

   a) Confirmation Review, a first attempt of which would normally take place between months 12-15 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 21 month of the student's initial registration for full time students.

   b) Minimum period of registration, which in this case will be 3 years.

   c) Students will meet the requirements of the DDP via provision within the programmes taught modules and supervisory meetings. This will comprise an equivalent scheme of activities requiring students to engage in a reflective process, attain the core competencies, and evidence their development. However, they will not be required to undertake:
   (i) separate modules at either Faculty or departmental level which students are ordinarily required to complete as part of the DDP, including the Faculty Research Ethics and Integrity module.
   (ii) an Evidencing Development Summary.

   Students will engage with equivalent Research Ethics and Integrity provision, as approved by the Faculty, and complete a Training Needs Analysis (TNA).

5. In order to proceed to Year Two a student must:

   a) pass not less than 40 credits of CDT-specific training; and
   b) attend and engage with non-credit bearing training and adhere to all standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.

6. In order to proceed to Year Three a student must:

   a) pass not less than 50 credits of CDT-specific training; and
   b) attend and engage with non-credit bearing training and adhere to all standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.

7. In order to proceed to Year Four a student must:

   a) pass not less than 80 credits of CDT-specific training; and
   b) attend and engage with non-credit bearing training and adhere to all standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.

For students with initial registration from 2024/25.

1. In Year One a student will take

CIV443/ MAC412	F7	Civic Priorities for Water	10
CIV445/ MAC414	F7	Environmental and Circular Economics	10
CIV444/ MAC413	F7	Digitilisation and Artificial Intelligence	30
CIV452/ MAC415	F7	Year 1 Summer Challenge	10
CIV447/ MAC419	F7	Transferable Skills Module 1: Collaborative and Creative Innovation	0

2. In Year Two a student will take:

CIV456/ MAC416	F7	Year 2 Summer Challenge	10
CIV448/ MAC420	F7	Transferable Skills Module 2: Communication to Enable Change	0

3. In Year Three a student will take:

CIV457/ MAC417	F7	Year 3 Summer Challenge	10
CIV449/ MAC421	F7	Transferable Skills Module 3: Futures Thinking, Risk and Resilience	0

4. In Year Four a student will take:

CIV450/ MAC422	F7	Transferable Skills Module 4: Career and Personal Skills Planning	0

5. During Years One to Three a student must also take and pass at least two additional MSc level modules (minimum 10 credits each). These may be selected from the range of taught modules available at Sheffield, Cranfield or Newcastle.

6. In order to proceed to Year Two a student must pass not less than 30 credits in respect of the units listed at (1) above.

7. In order to proceed to Year Three a student must pass not less than 10 credits in respect of the units listed at (2) above.

8. In order to proceed to Year Four a student must pass not less than 10 credits in respect of the units listed at (3) above, and a minimum of 20 credits in respect of the units described in (5).

9. In Years One to Four a student will also pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those Regulations, with the following exceptions:
    a) Confirmation Review, a first attempt of which would normally take place between months 12-15 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 21 month of the student's initial registration for full time students.
    b) Students will meet the requirements of the DDP via provision within the programmes taught modules and supervisory meetings. This will comprise an equivalent scheme of activities requiring students to engage in a reflective process, attain the core competencies, and evidence their development. However, they will not be required to undertake:
        i. separate modules at either Faculty or departmental level which students are ordinarily required to complete as part of the DDP, including the Faculty Research Ethics and Integrity module.
        ii. an Evidencing Development Summary.

    Students will engage with equivalent Research Ethics and Integrity provision, as approved by the Faculty, and complete a Training Needs Analysis (TNA).

CMBR003 Yorkshire Bioscience Doctoral Landscape Award (PhD) (DLA)

For students with initial registration from 2025/26.

1. During the programme a student will take BIS601: Doctoral Training Placement. This will normally be completed during Year Two or Three.
2. In order to be eligible to attempt the viva examination, a student must have passed BIS601: Doctoral Training Placement.
3. In Years One to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research and will present a thesis in accordance with those Regulations, with the exception of the minimum period of registration, which in this case will be three years.

CPER200/MATR82/CMBR011 Skills And Training Underpinning a Renaissance in Nuclear (SATURN) (Full Time) (PhD) (CDT)

(Joint programme with the University of Manchester)

For students with an initial registration from 2024/25.

1. In Year One a student will take

CPE429/ CMB485	F7	Introduction to the Chemistry, Physics, and Materials Science of the Nuclear Fuel Cycle	15
CPE432/ CMB486	F7	Site Visits, Winter School, Environmental Geochemistry, and Radioactive Waste Disposal	15
CPE428/ CMB432	F7	Specialist Skills Training 1: Foundation Independent Research and Professional Skills	30

2. In order to proceed to Year Two a student must pass not less than forty-five credits in respect of units listed at (1) above.

3. A student who has been awarded *sixty* credits in respect of units listed at 1 above and who is ineligible for a research award will be eligible for the award of Postgraduate Certificate in Nuclear Science.

5. In Years Two to Four a student will also pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those Regulations, with the following exception:
    a) Confirmation Review, a first attempt of which would normally take place between months 12-15 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 21 months of the student's initial registration for full-time students.

COMR191/HCSR42 SPEECH AND LANGUAGE TECHNOLOGIES (PhD with Integrated PGDip) (Full-Time) (CDT)

For students with initial registration from 2019/20.

1. In Year One a student will take

COM61003	F7	Introduction to Responsible SLT Leadership	15
COM61004	F7	Introduction to Collaborative Research Practice for SLT	15

A student will take **45 credits** from the following

COM6012	F7	Scalable Machine Learning	15
COM6115	F7	Text Processing	15
COM6502	F7	Speech Processing	15
COM6509	F7	Machine Learning and Adaptive Intelligence	15
COM6511	F7	Speech Technology	15
COM6513	F7	Natural Language Processing	15

One or more optional modules may be substituted for alternative modules at the discretion of the CDT Director.

2. In Year Two a student will take

COM61005	F7	SLT Research and Leadership Practice 1: Scientific Foundation	15

3. In Year Three a student will take

COM61006	F7	SLT Research and Leadership Practice 2: Core Research	15

4. In Year Four a student will take

COM61007	F7	SLT Research and Leadership Practice 3: Dissemination and Impact	15

5. In Years One to Four a student will also pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those Regulations, with the following exceptions:
   b) Confirmation Review, a first attempt of which would normally take place between months 15-18 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 24 months of the student's initial registration for full-time students; and
   c) minimum period of registration, which in this case will be 4 years; and
   d) students will meet the requirements of the DDP via provision within the programmes taught modules and supervisory meetings. This will comprise an equivalent scheme of activities requiring students to engage in a reflective process, attain the core competencies, and evidence their development. However, they will not be required to undertake: (i) separate modules at either Faculty or departmental level which students are ordinarily required to complete as part of the DDP, including the Faculty Research Ethics and Integrity module. (ii) an Evidencing Development Summary. Students will engage with equivalent Research Ethics and Integrity provision, as approved by the Faculty, and complete a Training Needs Analysis (TNA).

6. In order to proceed to Year Two a student must:
   a) pass sixty credits in respect of units listed at 1 above; and
   b) adhere to all standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.

7. In order to proceed to Year Three a student must:
   a) have attended, engaged with, and are normally required to have passed COM6962: SLT Research and Leadership Practice 1: Scientific Foundation; and
   b) pass Confirmation Review and adhere to all other standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.

8. In order to proceed to Year Four a student must:
   a) have attended, engaged with, and are normally required to have passed COM6963 SLT Research and Leadership Practice 2: Core Research.
   b) adhere to all standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.

9. A student who has been awarded *sixty* credits in respect of units listed at 1 to 4 above and is ineligible for a research award, will be eligible for the award of PGCert in Speech and Language Technologies Leadership (COMT92).

10. A student who has been awarded *one hundred and twenty* credits in respect of units listed at 1, 2 and 3 above and is ineligible for a research award, will be eligible for the award of PGDip in Speech and Language Technologies Leadership (COMT91).

11. A student who is not eligible for the award of PhD and who has been awarded *sixty* credits in respect of units listed at 1 above may submit for the award of MPhil with Integrated PGCert in Speech and Language Technologies Leadership (COMR193).

12. A student who is not eligible for the award of PhD and who has been awarded *one hundred and twenty* credits in respect of units listed at 1, 2 and 3 above may submit for the award of MPhil with Integrated PGDip in Speech and Language Technologies Leadership (COMR192).

13. A student who has been awarded at least sixty credits (but fewer than one hundred and twenty credits) in respect of units listed at 1 to 4 and is eligible for the award of PhD, will be eligible for the award of PhD with Integrated PGCert in Speech and Language Technologies Leadership.

14. Any taught qualification awarded in an integrated form will not be classified.

COMR301 White Rose Doctoral Training Partnership (PhD) (DTP)

1. During the programme a student will take FCS603: Research in Practice. This will normally be completed during Year Two.

2. In order to be eligible to attempt the viva examination, a student must have passed FCS603: Research in Practice.

COMR302 White Rose Doctoral Training Partnership (PhD with Integrated PGCert) (DTP)

1. In Year One a student will take 60 credits from the following:

For students with an initial registration in 2024-25

SMI607	F7	Principles of Research Design I	15
SMI622	F7	Principles of Research Design II	15
SMI605	F7	Introduction to Qualitative Research	15
SMI606	F7	Introduction to Quantitative Research	15
SMI601	F7	Advanced Quantitative Methods for Social Research	15
SMI609	F7	Advanced Qualitative Methods	15
SMI613	F7	Working Beyond Disciplines	15

For students with an initial registration from 2025-26

EDC442	F7	Principles of Research Design	30
EDC473	F7	Introduction to Qualitative Research	15
EDC459	F7	Introduction to Quantitative Research	15
EDC466	F7	Advanced Quantitative Methods for Social Research	15
EDC460	F7	Advanced Qualitative Methods	15
EDC470	F7	Working Beyond Disciplines	15

2. Following the successful completion of the 60 credits of units listed in (a), a student will take FCS603: Research in Practice. This will normally be completed during Year Two.
3. In order to be eligible to attempt the viva examination, a student must have passed FCS603: Research in Practice.
4. A student who has been awarded sixty credits in respect of units listed at (a) above and is ineligible for a research award, will be eligible for the award of PGCert in Social Research (White Rose DTP).
5. A student who is not eligible for the award of PhD and who has been awarded sixty credits in respect of units listed at (a) above may submit for the award of MPhil with Integrated PGCert in Social Research.
6. Any taught qualification made in an integrated form will not be classified.

EEER84/MGTR103 COMPOUND SEMICONDUCTOR MANUFACTURING (PhD) (Full-Time) (CDT)

(Joint Programme with the University of Cardiff, the University of Leeds and University College London)

1. In Years Two to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those Regulations, with the following exception:
   a) Confirmation Review, a first attempt of which would normally take place between months 18-21 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 27 months of the student's initial registration for full-time students.
   b) Minimum period of registration, which in this case will be 3 years.

MACR049/MACR050/COMR84 MADE4Manufacturing - Machining, Assembly, and Digital Engineering for Manufacturing (PhD) (EngD) (CDT)

For students with initial registration from 2025/26.

1. In Year One a student will take:

(a)	MAC4112	F7	Data Science and Software Engineering in Manufacturing	15
	MAC4113	F7	MADE Challenge and Project Management	15
(b)	Units to the value of thirty credits from the following:			
	MAC444	F7	Industrial Applications of Finite Element Analysis	15
	MAC462	F7	Fundamentals and Applications of Tribology	15
	MAC493	F7	Advanced Dynamics	15
	MAC494	F7	Additive Manufacturing – Principles and Applications	15
	MAC495	F7	Mechanics and applications of advanced manufacturing technologies	15
	MAC4105	F7	Advanced Aerospace Propulsion Technology	15
	MAC464	F7	Experiments and Valid Computer Models	15
	CMB4147	F7	Sustainable Materials Manufacturing	15
	CMB4138	F7	Design and Manufacture of Composites	15
	ELE426	F7	Industrial Automation	15
(c)	MAC4111	F7	Machining, Assembly and Digital Engineering mini project	30

Other units may be substituted for those listed in 1(b) at the discretion of the Director of the CDT.

2. In order to proceed to Year Two a student must pass ninety credits in respect of units listed at 1 (a), (b) and (c) above.
3. In order to proceed to Year Two a student must also undertake further academic and professional skills related modules and activities that are prescribed by the CDT academic directors. This shall include the Faculty Research Ethics and Integrity module.
4. A student who has been awarded sixty credits in respect of 1(a) and 1(b), and does not proceed to Year Two, may instead become a student for the award of Postgraduate Diploma in Machining, Assembly, and Digital Engineering for Manufacturing and in addition to 1(a), (b) will take MAC4114 Machining, Assembly and Digital Engineering Research Project (60).
5. A student who has been awarded sixty credits in respect of 1(a) and 1(b), and is ineligible for a research award, will be eligible for the award of PGCert in Machining, Assembly, and Digital Engineering for Manufacturing.
6. In Years One to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees and will present a thesis in accordance with

those Regulations. The programme of research may include content from MAC4111. The exception will be:

a) Confirmation Review, a first attempt of which would normally take place between months 15-18 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 24 months of the student's initial registration for full time students.

7. In Years Two to Four a student will undertake further academic and professional skills related modules and activities that are prescribed by the CDT Academic Directors.

8. A student will successfully complete the CDT's confirmation procedures before progressing to the third year of study.

MACR051/MACR052 OFFSHORE WIND ENERGY SUSTAINABILITY AND RESILIENCE (AURA II) (PhD) (EngD) (CDT)

(Joint programme with the University of Hull, the University of Durham and the University of Loughborough.)

For students with initial registration from 2025/26.

1. In Year One a student will take

MAC4120	F7	The Modern Researcher 1: Essential Skills, Knowledge and Training	20
MAC4118	F7	Offshore Wind Energy	20
MAC4116	F7	Environmental Issues in Offshore Wind	20
MAC4115	F7	Cutting Edge Concepts	20
MAC4119	F7	Outreach and Engagement for Aura CDT II	10

2. In order to proceed to Year Two a student must pass 90 credits in respect of units listed at 1 above.

3. In Years One and Two a student will take:

MAC4121	F7	Negotiated Learning 1	10
MAC4117	F7	Negotiated Learning 2	20

4. In order to proceed to Year Three a student must pass 120 credits in respect of units listed at 1 and 3 above.

5. A student who has been awarded sixty credits of units listed in 1 and 3 above and who is ineligible for a research award will be eligible for a Postgraduate Certificate in Research Training awarded by the University of Hull.

6. A student who has been awarded one hundred and twenty credits of units listed in 1 and 3 above and who is ineligible for a research award will be eligible for a Postgraduate Diploma in Research Training awarded by the University of Hull.

7. In Years One to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees and will present a thesis in accordance with those Regulations with the following exception:

a) Confirmation Review, a first attempt of which would normally take places between months 12-15 from the student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 21 months of the student's initial registration for full-time students.

MATR50/MECR104 ADVANCED METALLIC SYSTEMS (Full-Time) (PhD) (DTC)
MATR56 ADVANCED METALLIC SYSTEMS (Full-Time) (EngD) (DTC)

(Joint programme with The University of Manchester)

For students whose registration was in the academic year 2018-19.

1. In Year One all PhD or EngD candidates shall take the units listed in 1(a).

   In Year One all PhD or EngD candidates with a non-Materials discipline Degree shall take the units listed in 1(b).

   In Year One a PhD or an EngD candidate with a Materials Degree shall take the units listed in 1(c) below.

   In Year One a PhD or an EngD candidate with a Materials Degree shall take one of the units listed in 1(d) below.

   Alternative courses to the same credit value may be substituted at the discretion of the CDT Director.

(a)	MAT6294	F7	Transformative Technologies	15
	MAT6279	F7	Innovative Manufacturing	10
	MAT6299	F7	Mini Research Project and Experimental Skills	30
(b)	MAT6292	F7	Structure, Properties and Modelling of Metallic Materials	15
	MAT6511	F7	Phase Transformations in Materials Processing	15
	MATS64402	F7	Advanced Metals Processing	15
	MATS64502	F7	Superalloys and High-Performance Materials	15
	MAT333	F7	Metals	10
(c)	AER4447	F7	Industrial Training Programme	20
	MEC6014	F7	Introduction to MATLAB	5
	MAT6292a	F7	Modelling, Heat Transformation and Data Analysis	15
	MATS64662	F7	Research Software Engineering Practice	15
(d)	MATS43102	F7	Advanced Metals Processing	15
	MATS43202	F7	Superalloys and High-Performance Materials	15

*MATS codes denote University of Manchester units

2. In order to proceed to Year Two a student will satisfy the requirements of the CDT Academic Progression Committee.
3. A student will successfully complete the Doctoral Training Centre's upgrading procedures before being upgraded to PhD or EngD status.
4. A candidate who has been awarded *one hundred and twenty* credits as described at 1 above and does not proceed to Year Two:

   (i) shall be eligible for the award of Postgraduate Diploma in Advanced Metallic Systems (MATT104) *or*

   (ii) may become instead a candidate for the award of MSc Advanced Metallic Systems (MATT121) and in addition to 1 above shall take:

   MAT6499a F7 Research Project 60
5. A candidate who has been awarded *sixty* credits in respect of 1 above and does not proceed to Year Two shall be eligible for the award of Postgraduate Certificate in Advanced Metallic Systems (MATT123).
6. In Years Two to Four a candidate shall pursue a programme of research in accordance with the General Regulations for Higher Degrees and shall present a thesis in accordance with those Regulations with the following exception:
   a) Students will meet the requirements of the DDP via provision within the programmes taught modules and supervisory meetings. This will comprise an equivalent scheme of activities requiring students to engage in a reflective process, attain the core competencies, and evidence their development. However, they will not be required to undertake:
   (i) separate modules at either Faculty or departmental level which students are ordinarily required to complete as part of the DDP, including the Faculty Research Ethics and Integrity module.
   (ii) an Evidencing Development Summary.
   Students will engage with equivalent Research Ethics and Integrity provision, as approved by the Faculty, and complete a Training Needs Analysis (TNA)
   b) Minimum period of registration, which in this case will be 3 years.
7. In Years One to Four a candidate shall take the Postgraduate Diploma in Personal and Professional Skills (DTMT10).
8. An EngD candidate is expected to spend up to 75% of their time in their sponsoring company.

MATR107/DENR89 ADVANCED BIOMEDICAL MATERIALS (PhD) (Full-Time) (CDT)

(Joint Programme with the University of Manchester)

1. In Years Two to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those Regulations, with the following exception:
   a) Confirmation Review, a first attempt of which would normally take place between months 18-21 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 27 months of the student's initial registration for full-time students.
   b) minimum period of registration, which in this case will be 3 years.

MATR143/CPER105 GROWING SKILLS FOR RELIABLE ENERGY FROM NUCLEAR (GREEN) (PhD with Integrated PGDip in Professional Skills) (Full-Time) (CDT)

(Joint programme with the University of Manchester.)

For students with initial registration from 2019/20.

1. In Year One a student will take

(a)	MAT6801	F7	Introduction to the Chemistry and Physics of the Nuclear Fuel Cycle	15
	MAT6802	F7	Materials Science in the Nuclear	15

			Fuel Cycle	
	MAT6804	F7	Environmental Radiochemistry and the Science of Radioactive Waste Disposal	15
(b)	MAT6803	F7	Site Visits, Winter School and Skills Training	15
	MAT61006	F7	Research Skills 1: Foundation Independent Research and Professional Skills	45
	MAT61007	F7	Research Skills 2: Core Independent Research and Professional Skills	45
	FCE6100	F7	Professional Behaviour and Ethical Conduct	0

2. In order to proceed to Year Two a student must pass not less than *one hundred and thirty-five* credits in respect of units listed at 1 above.

3. A student who does not proceed to Year Two of the PhD may instead be permitted to become a student for the award of MSc Nuclear Science and Engineering (MATT152). In addition, they will take:

MAT6800	F7	Extended Research Project	30

4. A student who does not proceed to Year Two but has been awarded *one hundred and twenty* credits in respect of units listed at 1 above, including *forty-five* credits from 1a, will be eligible for the award of PGDip Nuclear Science and Engineering (MATT153). A student who has been awarded one *hundred and twenty* credits in respect of units listed at 1 above but with fewer than *forty-five* credits from 1a will be eligible for the award of PGDip Professional Skills (MATT154).

5. In Years Two to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those Regulations, with the following exceptions:
   a) Confirmation Review, a first attempt of which would normally take place between months 21-24 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 30 months of the student's initial registration for full-time students; and
   b) minimum period of registration, which in this case will be 3 years.

6. In order to proceed to Year Three a student must:
   a) attend and engage with CDT-specific training
   b) Undertake a first attempt of Confirmation Review and adhere to all other standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.

7. In order to proceed to Year Four a student must:
   a) attend and engage with CDT-specific training.
   b) Pass Confirmation Review and adhere to all other standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.

8. A student who is not eligible for the award of PhD, and who has been awarded *one hundred and twenty* credits in respect of units listed at 1 above may submit for the award of MPhil with Integrated PGDip in Professional Skills (MATR144).

9. A student will have the option to undertake a placement as an integral part of the programme, typically between 3-6 months in length.

10. Any taught qualification awarded in an integrated form will not be classified.

MATR145 ADVANCED METALLIC SYSTEMS (PhD with Integrated PGDip in Personal and Professional Skills) (Full-Time) (CDT)

MATR146/MECR114/EEER07 ADVANCED METALLIC SYSTEMS (EngD with Integrated PGDip in Personal and Professional Skills) (Full-Time) (CDT)

(Joint programme with the University of Manchester, University College Dublin and Dublin City University.)

For students with initial registration from 2019/20.

MATS codes denote University of Manchester units
COMP codes denote University College Dublin units
MM codes denote Dublin City University units

1a. In Year One a student will take

COMP47670	F7	Data Science in Python	5
MAT61001	F7	Advanced Modelling Techniques Part 1	5
MAT61002	F7	Structure and Mechanical Properties	10
MAT61005	F7	Phase Transformation and Solidification	10

1b.

MAT6299	F7	Mini Research Project	30
MAT6294	F7	Transformative Technologies	10
MAT61004	F7	The Modern Research Environment	10
AER4447	F7	Industrial Training Programme	20

1c. 30 credits from the following

MATS64402	F7	Advanced Metals Processing	15
MATS64502	F7	High Performance Materials	15
MATS64662	F7	Research Software Engineering Practice	15
MM601	F7	CFD with Open Foam	15
MM600	F7	LabVIEW Data Acquisition, Analysis and Control	15
MM555	F7	Manufacturing Process Analysis and Tool Design	15
MM602	F7	Additive Manufacturing	15

2. In Years Two to Four a student will take

FCE608	F7	Doctoral Writing Skills	10
MAT6297	F7	Public Engagement Project	10

FCE6011	F7	SME Consultancy Project	10
MAT6291	F7	Standards, Codes and Specifications	5
MAT6398	F7	Science and Engineering in the Media	5
FCE6009	F7	Skills in Action	10

Alternative courses to the same credit value may be substituted at the discretion of the CDT Director.

3. In order to proceed to Year Two all students must pass no less than one hundred and fifteen credits in respect of units 1 above, and to include MAT6299.
4. A student who has been awarded *sixty* credits in respect of units listed at 1 above and does not proceed to Year Two will be eligible for the award of PGCert in Advanced Metallic Systems (MATT150).
5. A student who has been awarded at least *one hundred and twenty* credits but less than one hundred and eighty credits in respect of units listed at 1 above and is ineligible for a research award, will be eligible for the award of PGDip in Advanced Metallic Systems (MATT149).
6. In Years Two to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those Regulations, with the following exceptions:
   a) Confirmation Review, a first attempt of which would normally take place between months 18-21 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 27 months of the student's initial registration for full-time students; and
   b) minimum period of registration, which in this case will be 3 years for Full Time students; and
   c) students will meet the requirements of the DDP via provision within the programmes taught modules and supervisory meetings. This will comprise an equivalent scheme of activities requiring students to engage in a reflective process, attain the core competencies, and evidence their development. However, they will not be required to undertake.
   (i) separate modules at either Faculty or departmental level which students are ordinarily required to complete as part of the DDP, including the Faculty Research Ethics and Integrity module.
   (ii) an Evidencing Development Summary.
   Students will engage with equivalent Research Ethics and Integrity provision, as approved by the Faculty, and complete a Training Needs Analysis (TNA).
7. An EngD candidate is expected to spend up to 75% of their time in their sponsoring company.
8. In order to proceed to Year Three a student must:
   a) attend and engage with CDT-specific training
   b) undertake a first attempt of Confirmation Review and adhere to all other standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.
9. In order to proceed to Year Four a student must:
   a) attend and engage with CDT-specific training.
   b) pass Confirmation Review and adhere to all standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.
10. A student who has been awarded one hundred and eighty credits in respect of units listed at 1 and 2 above, who exits the programme early and is ineligible to submit for a research award, will be eligible for the award of MSc in Advanced Metallic Systems (MATT148).
11. A Sheffield PhD student must be awarded one hundred and twenty credits in respect of units listed in 1b and 2 to be eligible for the final award of PhD with Integrated PGDip in Personal and Professional Skills (MATR145). A student who is awarded less than one hundred and twenty credits will be eligible for the final award of PhD Advanced Metallic Systems (MATR148).
12. A Sheffield EngD student must be awarded one hundred and twenty credits in respect of units listed in 1b and 2 above to be eligible for the final award of EngD with Integrated PGDip in Personal and Professional Skills (MATR146). A student who is awarded less than one hundred and twenty credits will be eligible for the final award of EngD Advanced Metallic Systems (MATR149).
13. A Sheffield student who is not eligible for the award of PhD or EngD, and who has been awarded one hundred and twenty credits in respect of units listed at 1b and 2 above may submit for the award of MPhil with Integrated PGDip in Advanced Metallic Systems (MATR150).
14. A Sheffield student who is not eligible for the award of PhD or EngD and has not been awarded one hundred and twenty credits in respect of units listed at 1b and 2 above, may submit for the award of MPhil in Advanced Metallic Systems.
15. Any taught qualification awarded in an integrated form will not be classified.

MATR145 ADVANCED METALLIC SYSTEMS (PhD with Integrated PGDip in Personal and Professional Skills) (Full-Time) (CDT)

MATR146, MECR114, EEER07 ADVANCED METALLIC SYSTEMS (EngD with Integrated PGDip in Personal and Professional Skills) (Full-Time) (CDT)

(Joint programme with the University of Manchester, University College Dublin and Dublin City University.)

For students with initial registration from 2020/21 or 2021/22.

MATS codes denote University of Manchester units
COMP codes denote University College Dublin units
MM codes denote Dublin City University units

1a. In Year One a student will take

COMP47670	F7	Data Science in Python	5
MAT61001	F7	Advanced Modelling Techniques Part 1	5
MAT61002	F7	Structure and Mechanical Properties	10
MAT61005	F7	Phase Transformation and Solidification	10

1b.

MAT6299	F7	Mini Research Project	30
MAT6294	F7	Transformative Technologies	10
MAT61004	F7	The Modern Research Environment	10
AER4447	F7	Industrial Training Programme	20

1c. 30 credits from the following

MAT61008	F7	Advanced Metals Processing (MATS64402)	15
MATS64502	F7	High Performance Materials	15
MATS64662	F7	Research Software Engineering Practice	15
MM601	F7	CFD with Open Foam	15
MM600	F7	LabVIEW Data Acquisition, Analysis and Control	15
MM555	F7	Manufacturing Process Analysis and Tool Design	15

MM602	F7	Additive Manufacturing	15

2. In Years Two to Four a student will take

FCE6008	F7	Doctoral Writing Skills	10
MAT6297	F7	Public Engagement Project	10
FCE6011	F7	SME Consultancy Project	10
MAT6291	F7	Standards, Codes and Specifications	5
MAT6398	F7	Science and Engineering in the Media	5
FCE6009	F7	Skills in Action	10

Alternative courses to the same credit value may be substituted at the discretion of the CDT Director.

3. In order to proceed to Year Two all students must pass no less than one hundred and fifteen credits in respect of units 1 above, and to include MAT6299.
4. A student who has been awarded *sixty* credits in respect of units listed at 1 above and does not proceed to Year Two will be eligible for the award of PGCert in Advanced Metallic Systems (MATT150).
5. A student who has been awarded at least *one hundred and twenty* credits but less than one hundred and eighty credits in respect of units listed at 1 above and is ineligible for a research award, will be eligible for the award of PGDip in Advanced Metallic Systems (MATT149).
6. In Years Two to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those Regulations, with the following exceptions:
   a) Confirmation Review, a first attempt of which would normally take place between months 18-21 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 27 months of the student's initial registration for full-time students; and
   b) minimum period of registration, which in this case will be 3 years for Full Time students; and
   c) students will meet the requirements of the DDP via provision within the programmes taught modules and supervisory meetings. This will comprise an equivalent scheme of activities requiring students to engage in a reflective process, attain the core competencies, and evidence their development. However, they will not be required to undertake.
   (i) separate modules at either Faculty or departmental level which students are ordinarily required to complete as part of the DDP, including the Faculty Research Ethics and Integrity module.
   (ii) an Evidencing Development Summary.
   Students will engage with equivalent Research Ethics and Integrity provision, as approved by the Faculty, and complete a Training Needs Analysis (TNA).
7. An EngD candidate is expected to spend up to 75% of their time in their sponsoring company.
8. In order to proceed to Year Three a student must:
   a) attend and engage with CDT-specific training
   b) undertake a first attempt of Confirmation Review and adhere to all other standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.
9. In order to proceed to Year Four a student must:
   a) attend and engage with CDT-specific training.
   b) pass Confirmation Review and adhere to all standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.
10. A student who has been awarded one hundred and eighty credits in respect of units listed at 1 and 2 above, who exits the programme early and is ineligible to submit for a research award, will be eligible for the award of MSc in Advanced Metallic Systems (MATT148).
11. A Sheffield PhD student must be awarded one hundred and twenty credits in respect of units listed in 1b and 2 to be eligible for the final award of PhD with Integrated PGDip in Personal and Professional Skills (MATR145). A student who is awarded less than one hundred and twenty credits will be eligible for the final award of PhD Advanced Metallic Systems (MATR148).
12. A Sheffield EngD student must be awarded one hundred and twenty credits in respect of units listed in 1b and 2 above to be eligible for the final award of EngD with Integrated PGDip in Personal and Professional Skills (MATR146). A student who is awarded less than one hundred and twenty credits will be eligible for the final award of EngD Advanced Metallic Systems (MATR149).
13. A Sheffield student who is not eligible for the award of PhD or EngD, and who has been awarded one hundred and twenty credits in respect of units listed at 1b and 2 above may submit for the award of MPhil with Integrated PGDip in Advanced Metallic Systems (MATR150).
14. A Sheffield student who is not eligible for the award of PhD or EngD and has not been awarded one hundred and twenty credits in respect of units listed at 1b and 2 above, may submit for the award of MPhil in Advanced Metallic Systems.
15. Any taught qualification awarded in an integrated form will not be classified.

MATR145 ADVANCED METALLIC SYSTEMS (PhD with Integrated PGDip in Personal and Professional Skills) (Full-Time) (CDT)

MATR146, MECR114, EEER07 ADVANCED METALLIC SYSTEMS (EngD with Integrated PGDip in Personal and Professional Skills) (Full-Time) (CDT)

(Joint programme with the University of Manchester, University College Dublin and Dublin City University.)

For students with initial registration from 2022/23 or 2023/24.

MATS codes denote University of Manchester units
COMP codes denote University College Dublin units
MM codes denote Dublin City University units

1a. In Year One a student will take

COMP47670	F7	Data Science in Python	5
MAT61001	F7	Advanced Modelling Techniques Part 1	5
MAT61002	F7	Structure and Mechanical Properties	10
MAT61005	F7	Phase Transformation and Solidification	10

1b.

MAT6299	F7	Mini Research Project	30
MAT6294	F7	Transformative Technologies	10
MAT61004	F7	The Modern Research Environment	10
AER61005	F7	Industrial Training Programme	15

1c. 30 credits from the following

MAT61008	F7	Advanced Metals Processing (MATS64402)	15
MATS64502	F7	High Performance Materials	15

MATS64662	F7	Research Software Engineering Practice	15
MM601	F7	CFD with Open Foam	15
MM600	F7	LabVIEW Data Acquisition, Analysis and Control	15
MM555	F7	Manufacturing Process Analysis and Tool Design	15
MM602	F7	Additive Manufacturing	15

2. In Years Two to Four a student will take

FCE6008	F7	Doctoral Writing Skills	10
MAT6297	F7	Public Engagement Project	10
FCE6011	F7	SME Consultancy Project	10
MAT6291	F7	Standards, Codes and Specifications	5
MAT6398	F7	Science and Engineering in the Media	5
FCE6009	F7	Skills in Action	10
FCE607	F7	Career Skills	5

Alternative courses to the same credit value may be substituted at the discretion of the CDT Director.

3. In order to proceed to Year Two all students must pass no less than one hundred and fifteen credits in respect of units 1 above, and to include MAT6299.
4. A student who has been awarded *sixty* credits in respect of units listed at 1 above and does not proceed to Year Two will be eligible for the award of PGCert in Advanced Metallic Systems (MATT150).
5. A student who has been awarded at least *one hundred and twenty* credits but less than one hundred and eighty credits in respect of units listed at 1 above and is ineligible for a research award, will be eligible for the award of PGDip in Advanced Metallic Systems (MATT149).
6. In Years Two to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those Regulations, with the following exceptions:
   a) Confirmation Review, a first attempt of which would normally take place between months 18-21 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 27 months of the student's initial registration for full-time students; and
   b) minimum period of registration, which in this case will be 3 years for Full Time students; and
   c) students will meet the requirements of the DDP via provision within the programmes taught modules and supervisory meetings. This will comprise an equivalent scheme of activities requiring students to engage in a reflective process, attain the core competencies, and evidence their development. However, they will not be required to undertake:
   (i) separate modules at either Faculty or departmental level which students are ordinarily required to complete as part of the DDP, including the Faculty Research Ethics and Integrity module.
   (ii) an Evidencing Development Summary.
   Students will engage with equivalent Research Ethics and Integrity provision, as approved by the Faculty, and complete a Training Needs Analysis (TNA).
7. An EngD candidate is expected to spend up to 75% of their time in their sponsoring company.
8. In order to proceed to Year Three a student must:
   a) attend and engage with CDT-specific training
   b) undertake a first attempt of Confirmation Review and adhere to all other standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.
9. In order to proceed to Year Four a student must:
   a) attend and engage with CDT-specific training.
   b) pass Confirmation Review and adhere to all standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.
10. A student who has been awarded one hundred and eighty credits in respect of units listed at 1 and 2 above, who exits the programme early and is ineligible to submit for a research award, will be eligible for the award of MSc in Advanced Metallic Systems (MATT148).
11. A Sheffield PhD student must be awarded one hundred and twenty credits in respect of units listed in 1b and 2 to be eligible for the final award of PhD with Integrated PGDip in Personal and Professional Skills (MATR145). A student who is awarded less than one hundred and twenty credits will be eligible for the final award of PhD Advanced Metallic Systems (MATR148).
12. A Sheffield EngD student must be awarded one hundred and twenty credits in respect of units listed in 1b and 2 above to be eligible for the final award of EngD with Integrated PGDip in Personal and Professional Skills (MATR146). A student who is awarded less than one hundred and twenty credits will be eligible for the final award of EngD Advanced Metallic Systems (MATR149).
13. A Sheffield student who is not eligible for the award of PhD or EngD, and who has been awarded one hundred and twenty credits in respect of units listed at 1b and 2 above may submit for the award of MPhil with Integrated PGDip in Advanced Metallic Systems (MATR150).
14. A Sheffield student who is not eligible for the award of PhD or EngD and has not been awarded one hundred and twenty credits in respect of units listed at 1b and 2 above, may submit for the award of MPhil in Advanced Metallic Systems.
15. Any taught qualification awarded in an integrated form will not be classified.

CPER05 ENERGY STORAGE AND ITS APPLICATIONS (PhD) (Full-Time)
CIVR100 ENERGY STORAGE AND ITS APPLICATIONS (PhD) (Full-Time)
EEER100 ENERGY STORAGE AND ITS APPLICATIONS (PhD) (Full-Time)
MATR100 ENERGY STORAGE AND ITS APPLICATIONS (PhD) (Full-Time)

(Joint programme with the University of Southampton)

For students whose registration is in the academic year 2018-19

1. In Year One a student will take

CPE604	F7	Global Energy Systems	15
CPE610	F7	Energy Storage CDT Mini-Project	15
CPE612	F7	Fundamentals of Energy Storage	30
CPE650	F7	Energy Storage CDT Summer Research Project (Sheffield)	60
FEEG6019	F7	Energy Storage Applications	30
PSY6018	F7	The Social Science of Energy Storage	15
SESG6041	F7	Introduction to Energy Technologies, Environment and Sustainability	15

*SESG and FEEG codes denote University of Southampton units.

2. In Years Two to Four a student can take

(a)	CPE613	F7	Skills in Action	15
	FCE610		Personal Effectiveness Skills	10
	FEEG6018		Personal & Professional Skills	15
	MEC6314		Innovation Management	10

	MEC6414	Technology Strategy and Business Planning	10
	MEC6428	Professional Responsibility of Engineers	10
	FCE607	Career Skills	5
(b)	A student can take either		
	CPE614	Public Engagement	5
	or		
	CPE634	Public Engagement	15
(c)	A student can take either		
	CPE635	CDT Researcher Development	15
	or		
	CPE615	CDT Researcher Development	30

3. In order to proceed to Year Two a student must pass not less than *one hundred and fifty* credits in respect of units listed at 1 above.
4. A student who has been awarded *one hundred and eighty* credits in respect of units listed at 1 above will be eligible for the MSc in Energy Storage and its Applications (CPET35).
5. A student who has been awarded *one hundred and twenty* credits in respect of units listed at 1 above will be eligible for the Postgraduate Diploma in Energy Storage and its Applications (CPET36).
6. In the event of failure in CPE650 Research project (Sheffield) at the first attempt any resubmission is subject to the approval of the Board of Examiners.
7. A student who has been awarded one hundred and twenty credits in respect of units listed at 2(a) and 2(b) above will be eligible for the Postgraduate Diploma in Personal and Professional Skills (CPER58).
8. A student who has been awarded sixty credits in respect of units listed at 2(a) and 2(b) above will be eligible for the Postgraduate Certificate in Personal and Professional Skills (CPER57).
9. A training placement may be required as an integral part of the programme. This would be an industrial placement or up to one month, and a one-week placement at the University of Southampton Malaysia Campus.
10. In Years Two to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research and will present a thesis in accordance with those Regulations.

MECR103/MGTR91 OFFSHORE RENEWABLE ENERGY (AURA) (PhD) (Full-Time) (CDT)

(Joint Programme with the University of Hull, the University of Durham and the University of Newcastle)

For students with an initial registration from 2019-20 to 2023-24.

1. In Years Two to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those Regulations, with the following exception:
    a) Confirmation Review, a first attempt of which would normally take place between months 18-21 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 27 months of the student's initial registration for full-time students.
    b) minimum period of registration, which in this case will be 3 years.

MECR07 INTEGRATED TRIBOLOGY (PhD) (Full-Time)

(Joint programme with the University of Leeds)

1. In Year One a student registered at The University of Sheffield will take

(a)	MEC6907	F7	Tribology Masterclass	0
	MEC6908	F7	Professional Skills	30
	MEC6905	F7	Mini Project - Group	30
	MEC6906	F7	Mini Project – Individual	30
(b)	plus *twenty* credits from (i)			
(i)	MAT3430	F6	Materials for Biological Devices	10
	MEC6403	F7	Reciprocating Engines	10
	MEC6429	F7	Mechanical Engineering of Railways	10
	MEC6440	F7	Advanced Finite Element Modelling	10
	plus *ten* credits from (ii)			
(ii)	MAT373	F6	Surface degradation and protection	10
	MAT6336	F7	Surfaces and Coatings	10

2. At (b) above, students may substitute other units with permission of the Programme Manager.
3. A student who has been awarded *one hundred and twenty* credits in respect of units listed at 1(a) and (b) above and who does not complete the requirements of the Degree of PhD will be eligible for the Postgraduate Diploma in Integrated Tribology (MEC.
4. Before proceeding to Year Two a student will complete MEC6908 Professional Skills.
5. In order to proceed to Year Two a student will satisfy the requirements of the CDT Academic Progression Committee.
6. A student will successfully complete the Doctoral Training Centre's upgrading procedures before being upgraded to PhD status.
7. In Years Two to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those Regulations with the following exception:
    a) minimum period of registration, which in this case is 3 years.

MECR80 INDUSTRIAL DOCTORATE IN MACHINING SCIENCE (Full Time) (EngD)
ACSR80 INDUSTRIAL DOCTORATE IN MACHINING SCIENCE (Full Time) (EngD)
MATR80 INDUSTRIAL DOCTORATE IN MACHINING SCIENCE (Full Time) (EngD)
CPER97 INDUSTRIAL DOCTORATE IN MACHINING SCIENCE (Full Time) (EngD)
MECR09 MACHINING SCIENCE (Full Time) (PhD)
MECR91 MACHINING SCIENCE (Full Time) (PhD)

MECT07 DIPLOMA IN MACHINING SCIENCE (PG Dip) (Part-Time)

1. In Year One a student will take

(a)	MAT61004	F7	Modern Research Environment	10
	MEC81001	F7	IDC Personal and Professional Skills Development	10
	MGT6256	F7	Managing Complex Projects and Risk Management	20
(b)	units to the value of *thirty* credits from the following			
	ACS329	F6	Robotics	15
	MAT6333	F7	Aerospace Metals	15
	MAT6444	F7	Advanced Materials Manufacturing Part 1	15
	MEC6405	F7	Experimental Stress Analysis	15
	MEC6411	F7	Tribology of Machine Elements	15
	MEC6415	F7	Condition Monitoring	15
	MEC6440	F7	Advanced Finite Element Modelling	15
	MEC6444	F7	Additive Manufacturing – Principles and Applications 1	15
	MEC6445	F7	Additive Manufacturing – Principles and Applications 2	15
	MEC6452	F7	Advanced Topics in Machining	15
(c)	MEC6901	F7	IDC Machining Science Mini-Project 1	30
	MEC6902	F7	IDC Machining Science Mini-Project 2	30
	MEC6903	F7	IDC Machining Science Mini-Project 3	30

Other units may be substituted for those listed in 1(b) at the discretion of the Academic Director of the IDC.

2. In order to proceed to Year Two a student must pass *one hundred and sixty* credits in respect of units listed at 1(a), (b), and (c) above.
3. A student who has been awarded *seventy* credits in respect of 1(a), (b), and (c) above and does not proceed to Year Two, may instead become a student for the award of Postgraduate Diploma in Machining Science (MECT07 PG Dip) and in addition to 1(a), (b) and (c) above will take

MEC6904	F7	IDC Machining Science Research Project	50

4. In Years Two to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees and will present a thesis in accordance with those Regulations.
5. In Years Two to Four a student will undertake further academic and professional skills related modules and activities appropriate to their studies, and also present at the AMRC Technical Fellows or IDC Student Conference.
6. A student will successfully complete the Industrial Doctorate Centre's confirmation procedures before progressing to the third year of study.

MECR49/MGTR102/MACR046 GREEN INDUSTRIAL FUTURES (Full Time or Part Time) (PhD) (CDT)

MECR50/MACR047 GREEN INDUSTRIAL FUTURES (Full Time or Part Time) (EngD) (CDT)

(Joint Programme with Heriot Watt University, Imperial College London and the University of Bath)

For students with initial registration from 2024/25.

1. In Year One a student will take

(a)	MEC468/ MAC484	F7	Carbon Solutions	15
	MEC472/ MAC486	F7	Whole Systems and Transformative Change	15
	MEC473/ MAC410	F7	Business Model Innovation and Investor Pitching for Net Zero	5
	MEC474/ MAC405	F7	Carbon Capture Pilot Plant	10
(b)	Elective courses to the value of 15-20 credits from the following options:			
	MEC438/ MAC461	F7	MEng Preparation for Practice	15
	MEC438/MAC461	F7	Preparation for Practice	15
	MEC441/ MAC487	F7	Sustainable Engineering Design	15
	MEC442/ MAC488	F7	Managing Innovation and Change in Engineering Contexts	15
	MEC445/ MAC444	F7	Industrial Applications of Finite Element Analysis	15
	MEC446/ MAC462	F7	Fundamentals and Applications of Tribology	15
	MEC448/ MAC490	F7	Railway Engineering and Sustainable Transport	15
	MEC449/ MAC491	F7	Advanced Engineering Fluid Dynamics	15
	MEC450/ MAC492	F7	Advanced Energy and Power	15
	MEC452/ MAC493	F7	Advanced Dynamics	15
	MEC456/ MAC496	F7	Additive Manufacturing – Principles and Applications	15
	MEC455/ MAC495	F7	Mechanics and Applications of Advanced Manufacturing Technologies	15
	MEC456/ MAC496	F7	Human Factors and User-centred Design	15
	MEC461/ MAC497	F7	Engineering Commercial Success: And Making the World a Better Place!	15
	MEC462/ MAC498	F7	Aviation Safety and Aeroelasticity	15
	MEC463/ MAC4105	F7	Advanced Aerospace Propulsion Technology	15
	MEC602/ MAC463	F7	Strategic Engineering Management and Business Practices	15
	MEC604/ MAC464	F7	Experiments and Valid Computer Models	15
	MEC467/ MAC466	F7	Computational Thermal Fluids Engineering	15
	MEC6400/ MAC465	F7	Professional Development Portfolio	15
(c)	MEC471/ MAC423	F7	Portfolio A	10

2. In Year Two a student will take:

(a)	MEC476/ MAC401	F7	Pilot-scale Practical Facilities Training at TERC	15
	MEC469/ MAC485	F7	Industry Challenge Project	15
(b)	MEC478/ MAC409	F7	Portfolio B	20

3. Alternative equivalent modules are permitted with the permission of the Programme Director.

4. To be eligible for the award of the PhD degree, a student must obtain at least 120 credits with a credit-weighted taught course average of at least 50%.

5. In Years One to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those regulations, with the following exception:

   (a) Confirmation Review, a first attempt of which would normally take place between months 15-18 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 24 months of the student's initial period of registration for full time students.

6. A student who has been awarded at least 120 credits with a credit-weighted taught course average of at least 50% and is ineligible for a research award will be eligible for the award of Postgraduate Diploma from Heriot Watt University.

7. A student who has been awarded at least 60 credits with a credit-weighted taught course average of at least 50% and is ineligible for a research award will be eligible for the award of Postgraduate Certificate from Heriot Watt University.

MECR92/CPER107/MATR110/MGTR101 RESILIENT DECARBONISED FUEL ENERGY SYSTEMS (Full Time or Part Time) (PhD) (CDT)

MECR93 RESILIENT DECARBONISED FUEL ENERGY SYSTEMS (Full Time or Part Time) (EngD) (CDT)

(Joint Programme with The University of Nottingham)

For students with initial registration from 2019/20.

1. In Year One a student will take

(a)	H84PGC	F7	Power Generation and Carbon Capture and Storage (Nottingham)	10
	L34118	F7	Energy Systems and Policy (Nottingham/Cardiff)	20
	MPP163	F7	Industrial Case Studies (Nottingham)	10
	H84RP3	F7	Research Project Portfolio: Part 1 (Nottingham)	10
	F84CSS	F7	Winter School (rotating)	0
	H14RPS	F7	Research and Professional Skills (Nottingham)	10
	H84LCP	F7	Low Carbon Processes (Nottingham)	10
	ENT721	F7	Risk and Hazard Management in the Energy Sector (Cardiff)	10
	MEC6020	F7	Pilot-scale Facilities Practical Training at the Translational Energy Research Centre (Sheffield)	20

2. In Year Two a student will take

CHEE4024	F7	Research Project Portfolio: Part 2 (Nottingham)	20

3. In Years One to Four a student will take

(a)	H141MP	F7	Industrial Mini Project (University of registration)	10
	H84CPE	F7	Communication & Public Energy Skills for Energy Researchers (Nottingham)	10

(b) units to the value of *thirty* credits selected from available technical or skills-based Masters modules delivered by CDT partner institutions.

(c) and engage with CDT training and development activities, as determined by the CDT Management Board.

4. A student who has been awarded *sixty* credits in respect of units listed at 1 and 2 above and who is ineligible for a research award, will be eligible for the award of Postgraduate Certificate in Decarbonised Fuel Energy Systems (MECT62).

5. A student who has been awarded *one hundred and twenty* credits in respect of units listed at 1 and 2 above and who is ineligible for a research award, will be eligible for the award of Postgraduate Diploma in Decarbonised Fuel Energy Systems (MECT61).

6. In Years Two to Four a student will pursue a programme of research in accordance with the General Regulations for Higher Degrees by Research, and will present a thesis in accordance with those Regulations, with the following exceptions:
   a) Confirmation Review, a first attempt of which would normally take place between months 15-18 from a student's initial date of registration with the CDT. The final decision regarding whether a student may be permitted to pass the Confirmation Review must be taken within 24 months of the student's initial registration for full-time students; and
   b) minimum period of registration, which in this case will be 3 years for a Full-time student and 6 years for a Part Time student.

7. In order to proceed to Year Three a student must undertake a first attempt of Confirmation Review and adhere to all other standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.

8. In order to proceed to Year Four a student must pass Confirmation Review and adhere to all standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.