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 Individual modules are occasionally updated or withdrawn.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

1. The programmes of study within the Faculty shall, subject to any provision in the Regulations for particular programmes of study, extend over:
   (a) one year for both a Master’s Degree and a Postgraduate Diploma for a full-time student, who will complete all components of the programme within the minimum period of study; or
   (b) not less than three consecutive years for a part-time student for a Master’s Degree, who will complete all components of the programme within the three year period; or
   (c) not less than two consecutive years for a part-time student for a Postgraduate Diploma, who will complete all components of the programme within the two year period.

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:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATR107</td>
<td>Advanced Biomedical Materials</td>
<td>PhD</td>
</tr>
<tr>
<td>MATR50</td>
<td>Advanced Metallic Systems</td>
<td>PhD</td>
</tr>
<tr>
<td>MATR56</td>
<td>Advanced Metallic Systems</td>
<td>EngD</td>
</tr>
<tr>
<td>MATR145</td>
<td>Advanced Metallic Systems</td>
<td>PhD</td>
</tr>
<tr>
<td>MATR146</td>
<td>Advanced Metallic Systems</td>
<td>EngD</td>
</tr>
<tr>
<td>EEER84</td>
<td>Compound Semiconductor Manufacturing</td>
<td>PhD</td>
</tr>
<tr>
<td>MECR83</td>
<td>E-Futures</td>
<td>PhD</td>
</tr>
<tr>
<td>CPER05</td>
<td>Energy Storage And Its Applications</td>
<td>PhD</td>
</tr>
<tr>
<td>CIVR100</td>
<td>Energy Storage And Its Applications</td>
<td>PhD</td>
</tr>
<tr>
<td>EEER100</td>
<td>Energy Storage And Its Applications</td>
<td>PhD</td>
</tr>
<tr>
<td>MATR100</td>
<td>Energy Storage And Its Applications</td>
<td>PhD</td>
</tr>
<tr>
<td>MATR143</td>
<td>Generating Renewable Economic</td>
<td>PhD</td>
</tr>
</tbody>
</table>

CIVR103/CIVR104 WATER INFRASTRUCTURE AND RESILIENCE (WIRe) (PhD) (Full-Time/Part Time) (CDT)

(Joint Programme with The University of Cranfield)

For students with initial registration from 2019/20.

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

For students with initial registration from 2019/20.

In Year One a student will take:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Type</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM61003</td>
<td>F7</td>
<td>Introduction to Responsible SLT Leadership</td>
<td>15</td>
</tr>
<tr>
<td>COM61004</td>
<td>F7</td>
<td>Introduction to Collaborative Research Practice for SLT</td>
<td>15</td>
</tr>
</tbody>
</table>

A student will take 45 credits from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Type</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM6012</td>
<td>F7</td>
<td>Scalable Machine Learning</td>
<td>15</td>
</tr>
<tr>
<td>COM6115</td>
<td>F7</td>
<td>Text Processing</td>
<td>15</td>
</tr>
<tr>
<td>COM6502</td>
<td>F7</td>
<td>Speech Processing</td>
<td>15</td>
</tr>
<tr>
<td>COM6509</td>
<td>F7</td>
<td>Machine Learning and Adaptive Intelligence</td>
<td>15</td>
</tr>
</tbody>
</table>

In Year Two a student will take:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Type</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM6511</td>
<td>F7</td>
<td>Speech Technology</td>
<td>15</td>
</tr>
<tr>
<td>COM6513</td>
<td>F7</td>
<td>Natural Language Processing</td>
<td>15</td>
</tr>
</tbody>
</table>

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

In Year Three a student will take:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Type</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM61006</td>
<td>F7</td>
<td>SLT Research and Leadership Practice 2: Core Research</td>
<td>15</td>
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</table>

In Year Four a student will take:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Type</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COM61007</td>
<td>F7</td>
<td>SLT Research and Leadership Practice 3: Dissemination and Impact</td>
<td>15</td>
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</tbody>
</table>

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:

- 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
- minimum period of registration, which in this case will be 4 years; and
- students will meet the requirements of the DDP via provision within the programme’s 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:
  - 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; and
  - 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).

For students with initial registration from 2019/20.

In Year One a student will take:

<table>
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A student will take 45 credits from the following:

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<td>Speech Processing</td>
<td>15</td>
</tr>
<tr>
<td>COM6509</td>
<td>F7</td>
<td>Machine Learning and Adaptive Intelligence</td>
<td>15</td>
</tr>
</tbody>
</table>

In order to proceed to Year Two a student must:

- pass not less than 40 credits of CDT-specific training; and
- 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.

In order to proceed to Year Three a student must:

- pass not less than 50 credits of CDT-specific training; and
- 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.

In order to proceed to Year Four a student must:

- pass not less than 80 credits of CDT-specific training; and
- 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.

In order to proceed to Year Two a student must:

- pass not less than 40 credits of CDT-specific training; and
- 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.

In order to proceed to Year Three a student must:

- pass not less than 50 credits of CDT-specific training; and
- 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.

In order to proceed to Year Four a student must:

- pass not less than 80 credits of CDT-specific training; and
- 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.

In order to proceed to Year Two a student must:

- pass sixty credits in respect of units listed at 1 above; and
- adhere to all standard Sheffield PGR progression rules, as per the Regulations for Higher Degrees by Research.

In order to proceed to Year Three a student must:

- have attended, engaged with, and are normally required to have passed COM6962: SLT Research and Leadership Practice 1: Scientific Foundation; and
- 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 (COMFT91).

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 (COMFT92).

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.

EEER84 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.

MECR83E-FUTURES (PhD) (Full-Time)
DTET10 PROFESSIONAL SKILLS (PGDip) (Part-Time)

1. In Year One a student will take
   (a) FCE6000 F7 Carbon Challenge 5
   (b) FCE6001 F7 Summer School 5

   FCE6003 F7 Introduction to Energy and Professional Skills 60
   FCE610 F7 Personal Effectiveness Skills 10
   FCE6004 F7 Mini Project 1 30
   FCE6005 F7 Mini Project 2 30
   FCE6006 F7 Mini Project 3 30

2. In order to proceed to Year Two a student must pass not less than one hundred and sixty credits in respect of units listed at 1(a) and (b) above.

3. A student who has been awarded one hundred and twenty credits in respect of units listed at 1(a) (above) and does not proceed to Year Two will be eligible for the award of Postgraduate Diploma in E-futures (DTET01).

4. 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.

5. In Years Two to Four a candidate shall take
   FCE6007 F7 Skills for Industry 15
   FCE6009 F7 Skills in Action 10
   FCE607 F7 Career Skills 5
   FCE609 F7 Public Engagement Project 10

6. A student will successfully complete the Doctoral Training Centre’s uprating procedures before progressing to the third year of study.

7. A student who has been awarded one hundred and twenty credits in respect of 1(a) and 5 above will be awarded the Postgraduate Diploma in Professional Skills (DTET10).
MATR50 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 2014-15, 2015-16, 2016-17 or 2017-18.

1. In Year One a PhD candidate shall take units listed in 1(a) and (b) below. In Year One an EngD candidate shall take units listed in 1(a) and either (b) or (c) below.

(a) MAT6292 F7 Structure, Properties and Modelling of Metallic Materials 15
MAT6511 F7 Phase Transformations in Materials Processing 15
MAT64571 F7 High Performance Alloys 15
MAT64601 F7 Materials Performance – Life Cycle Design 15
MAT6294 F7 Transformative Technologies 10

(b) MAT6278 F7 Advanced Metals Manufacturing 20
MAT6299 F7 Mini Research Project and Experimental Skills 30

(c) MAT6289 F7 Extended Mini Research Project and Experimental Skills 50

*MATS codes denote University of Manchester units.

2. In order to proceed to Year Two a PhD candidate must pass one hundred and twenty credits in respect of units listed at 1(a) and (b) above. An EngD candidate must pass one hundred and twenty credits in respect of units listed at 1(a) and either (b) or (c) above.

3. A candidate who has been awarded one hundred and twenty credits as described at 2 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(a) above shall take EITHER 4(a) or 4(b) below:

(a) MAT6278 F7 Advanced Metals Manufacturing 20
MAT6499 F7 Research Project 90

(b) MAT6599 F7 Research Project 110

4. A candidate who has been awarded sixty credits in respect of 1(a) above and does not proceed to Year 2 shall be eligible for the award of Postgraduate Certificate in Advanced Metallic Systems (MATT123).

5. 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 exceptions:

a) Students will meet the requirements of the DDP via provision within the programme's 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.

6. In Years One to Four a candidate shall take
   a) the Postgraduate Diploma in Personal and Professional Skills (DTMT10).
   b) Units selected from the Advanced Metallic Systems CDT Handbook to the value of a minimum of fifteen credits or an equivalent activity to be approved by the Course Director.
   An EngD candidate is expected to spend up to 75% of their time in their sponsoring company.

MATR50 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
MAT64402 F7 Advanced Metals Processing 15
MAT64502 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
MAT64662 F7 Research Software Engineering Practice 15

(d) MATS43102 F7 Advanced Metals Processing 15
MAT343202 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 programme's 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 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 GENERATING RENEWABLE ECONOMIC ENERGY FROM NUCLEAR (GREEN) (PhD with Integrated PGDip in Professional Skills) (Full-Time) (CDT)**

(Joint programme with the University of Manchester.)

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**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 Fuel Cycle 15
   MAT6804 F7 Environmental Radiochemistry and the Science of Radioactive Waste Disposal 15
   (b) MAT6803 F7 Site Visits, Winter School and Skills Training 15

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.

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

MATR146 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

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>COMP47670</td>
<td>Data Science in Python</td>
<td>F7</td>
</tr>
<tr>
<td>MAT61001</td>
<td>Advanced Modelling Techniques Part 1</td>
<td>F7</td>
</tr>
<tr>
<td>MAT61002</td>
<td>Structure and Mechanical Properties</td>
<td>F7</td>
</tr>
<tr>
<td>MAT61005</td>
<td>Phase Transformation and Solidification</td>
<td>F7</td>
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1b. In Year Two a student will take

<table>
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<th>Course Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>MAT6299</td>
<td>Mini Research Project</td>
<td>F7</td>
</tr>
<tr>
<td>MAT6294</td>
<td>Transformative Technologies</td>
<td>F7</td>
</tr>
<tr>
<td>MAT61004</td>
<td>The Modern Research Environment</td>
<td>F7</td>
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<tr>
<td>AER4447</td>
<td>Industrial Training Programme</td>
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1c. 30 credits from the following

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<tbody>
<tr>
<td>MATS64402</td>
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<td>F7</td>
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<tr>
<td>MATS64502</td>
<td>High Performance Materials</td>
<td>F7</td>
</tr>
<tr>
<td>MATS64662</td>
<td>Research Software Engineering Practice</td>
<td>F7</td>
</tr>
<tr>
<td>MM601</td>
<td>CFD with Open Foam</td>
<td>F7</td>
</tr>
<tr>
<td>MM600</td>
<td>LabVIEW Data Acquisition, Analysis and Control</td>
<td>F7</td>
</tr>
<tr>
<td>MM555</td>
<td>Manufacturing Process Analysis and Tool Design</td>
<td>F7</td>
</tr>
<tr>
<td>MM602</td>
<td>Additive Manufacturing</td>
<td>F7</td>
</tr>
</tbody>
</table>

2. In Years Two to Four a student will take

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCE608</td>
<td>Doctoral Writing Skills</td>
<td>F7</td>
</tr>
<tr>
<td>MAT6297</td>
<td>Public Engagement Project</td>
<td>F7</td>
</tr>
<tr>
<td>FCE6011</td>
<td>SME Consultancy Project</td>
<td>F7</td>
</tr>
<tr>
<td>MAT6291</td>
<td>Standards, Codes and Specifications</td>
<td>F7</td>
</tr>
<tr>
<td>MAT6398</td>
<td>Science and Engineering in the Media</td>
<td>F7</td>
</tr>
<tr>
<td>FCE6009</td>
<td>Skills in Action</td>
<td>F7</td>
</tr>
</tbody>
</table>

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 six 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 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 programme's 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.

MATR01 NEXT GENERATION NUCLEAR (PhD) (Full-Time)

(Joint programme with the University of Manchester)

1. In Year One a student will take
   - MAT6801 F7 Introduction to the Chemistry and Physics of the Nuclear Fuel Cycle 15
   - MAT6802 F7 Materials Science in the Nuclear Fuel Cycle 15
   - MAT6803 F7 Site Visits, Winter School and Skills Training 15
   - MAT6804 F7 Environmental Radiochemistry and the Science of Radioactive Waste Disposal 15
   - MAT6805 F7 DTC Project Rotation 1 45
   - MAT6806 F7 DTC Project Rotation 2 45

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

3. A student who has been awarded not less than one hundred and thirty-five credits in respect of units listed at 1 above and does not proceed to Year Two may become instead a student for the award of MSc(Res) Nuclear Fission (DTNT02) and in addition will take
   - MAT6800 F7 Extended Research Project 30

4. A student who has been awarded one hundred and twenty credits in respect of units listed at 1 above and does not proceed to Year Two will be eligible for the award of Postgraduate Diploma in Nuclear Fission (DTNT01).

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 exception:
   - a) minimum period of registration, which in this case will be 3 years.

6. A student will not be permitted to complete a Postgraduate Diploma in Professional Management and Leadership Skills.

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

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 was in the academic year 2014-15

1. In Year One a student will take
   - CPE604 F7 An Introduction to Energy and the Environment 15
   - CPE610 F7 Energy Storage CDT Mini-Project 15
   - CPE612 F7 Applied Energy Storage 30
   - CPE650 F7 Research project (Sheffield) 60
   - FEEG6019 F7 Energy Storage Applications 30
   - PSY6081 F7 The Social Science of Energy Storage 15
   - SESG6041 F7 Introduction to Energy Technologies, Environment and Sustainability 15

2. Delivered during the second, third and fourth year
   - CPE613 F7 Skills in Action 15
   - CPE614 Public Engagement 5
   - CPE615 Researcher Development 30
   - FCE6007 Skills for Industry 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

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 3(a) and 3(b) above will be eligible for the Master of Science (PhD) in Nuclear Fission (DTNT02) and in addition will take
   - MAT6800 F7 Extended Research Project 30

8. A student who has been awarded sixty credits in respect of units listed at 3(a) and 3(b) above will be eligible for the Postgraduate Diploma in Nuclear Fission (DTNT01).

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, with the following exception:
   - a) Minimum period of registration, which in this case will be 3 years.
For students whose registration was in the academic year 2015-16, 2016-17 or 2017-18

1. In Year One a student will take
   - CPE604 F7 Global Energy Systems 15
   - CPE610 F7 Energy Storage CDT Mini-Project 15
   - CPE612 F7 Applied Energy Storage 30
   - CPE650 F7 Research project (Sheffield) 60
   - FEeG6018 F7 Professional and Research Skills 15
   - FEeG6019 F7 Energy Storage Applications 30
   - SSeG6041 F7 Introduction to Energy Technologies, Environnment and Sustainability 15

2. Delivered during the second, third and fourth year
   - CPE613 F7 Skills in Action 15
   - CPE614 F7 Public Engagement 5
   - CPE615 F7 Researcher Development 30
   - FCe6007 F7 Skills for Industry 15
   - FCe610 F7 Personal Effectiveness Skills 10
   - MEC6314 F7 Innovation Management 10
   - MEC6414 F7 Technology Strategy and Business Planning 10
   - MEC6428 F7 Professional Responsibility of Engineers 10
   - PSY6081 F7 Social Science of Energy Storage 15

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 above will be eligible for the Postgraduate Certificate in Personal and Professional Skills (CPER08).
8. A student who has been awarded sixty credits in respect of units listed at 2 above will be eligible for the Postgraduate Diploma in Personal and Professional Skills.
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.

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
   - SSeG6041 F7 Introduction to Energy Technologies, Environment and Sustainability 15

2. In Years Two to Four a student can take

<table>
<thead>
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<th>Credits</th>
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<tr>
<td>(a) CPE613</td>
<td>F7 Skills in Action</td>
<td>15</td>
</tr>
<tr>
<td>FCE610</td>
<td>Personal Effectiveness Skills</td>
<td>10</td>
</tr>
<tr>
<td>FEEG6018</td>
<td>Personal &amp; Professional Skills</td>
<td>15</td>
</tr>
<tr>
<td>MEC6314</td>
<td>Innovation Management</td>
<td>10</td>
</tr>
<tr>
<td>MEC6414</td>
<td>Technology Strategy and Business Planning</td>
<td>10</td>
</tr>
<tr>
<td>MEC6428</td>
<td>Professional Responsibility of Engineers</td>
<td>10</td>
</tr>
<tr>
<td>FCE607</td>
<td>A student can take either</td>
<td>5</td>
</tr>
<tr>
<td>CPE614</td>
<td>Public Engagement</td>
<td>5</td>
</tr>
<tr>
<td>or CPE634</td>
<td>Public Engagement</td>
<td>15</td>
</tr>
<tr>
<td>CPE635</td>
<td>CDT Researcher Development</td>
<td>15</td>
</tr>
<tr>
<td>or CPE615</td>
<td>CDT Researcher Development</td>
<td>30</td>
</tr>
</tbody>
</table>

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 above will be eligible for the Postgraduate Certificate in Personal and Professional Skills (CPER08).
8. A student who has been awarded sixty credits in respect of units listed at 2 above will be eligible for the Postgraduate Diploma in Personal and Professional Skills.
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 OFFSHORE RENEWABLE ENERGY (AURA) (PhD) (Full-Time) (CDT)

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

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 exceptions:
   a) Confirmation Review, a first attempt of which 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
   MEC9006 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
   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
   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.

MECR92 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 Cranfield)
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
   H141MP F7 Industrial Mini Project (Uni of registration) 10
   MPP163 F7 Industrial Case Studies (Nottingham) 10
   H84RP3 F7 Research Project Portfolio: Part 1 (Uni of registration) 10
   H84CPE F7 Communication & Public Engagement Skills for Energy Researchers (Nottingham) 10
   F84CSS F7 Winter School (rotating) 0
   H14RPS F7 Research and Professional Skills (Nottingham) 10
   H84LCP F7 Low Carbon Processes (Nottingham) 10

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

2. In Year Two a student will take
   EN7721 F7 Risk and Hazard Management in the Energy Sector 10
   and engage with CDT training and development activities, as determined by the CDT management board.

3. 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).

4. 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).

5. A student who does not proceed to Year Three may instead be permitted to become a student for the award of MSc in Decarbonised Fuel Energy Systems (MECT60) and in addition will take
   F7 Extended Research Portfolio 50

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.

GENERAL REGULATIONS FOR PHD WITH INTEGRATED STUDIES IN THE FACULTY OF ENGINEERING

1. The following programmes of study and research are specified for the purposes of Regulation 3 within the Regulations for the Degree of PhD with Integrated Studies, as outlined in the General Regulations for Higher Degrees by Research:

   COMT190 ADVANCED COMPUTER SCIENCE (MSc)

   (For initial registration of a student of the Degree of PhD with Integrated Studies in Computer Science only)

   CPET90 ENVIRONMENTAL AND ENERGY ENGINEERING (MSc(Eng))

   (For initial registration of a student for the Degree of PhD with Integrated Studies only)