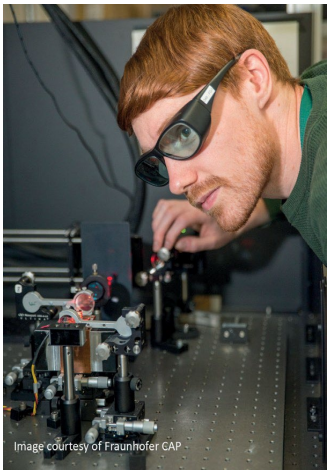
Engineering and Physical Sciences Research Council

CENTRE FOR DOCTORAL TRAINING IN APPLIED PHOTONICS
industry inspired: imaging | sensing | analysis

Research Student Handbook 2021-22



HERIOT WATT UNIVERSITY

University of Glasgow

University of Strathclyde Glasgow

University of St Andrews

University of Dundee

THE UNIVERSITY of EDINBURGH

Contents

1. Welcome

Welcome to the Centre for Doctoral Training (CDT) in Applied Photonics. The CDT is a joint venture between Heriot-Watt University and the universities of Dundee, Edinburgh, Glasgow, St Andrews, and Strathclyde.

This handbook gives an overview of the programme structure and the administrative arrangements, including contact details for key personnel.

The CDT programme is designed to provide a platform for well-qualified engineers and scientists to undertake research within an industrial environment, while also broadening their knowledge of photonics, electronic and business topics through specialist Masters level taught courses. The knowledge and experience you will gain from this programme will enable you to pursue a career in both the technical and business sectors.

Students on the programme come from a variety of backgrounds, typically already holding an excellent first degree from a physics or engineering discipline. During the course of your research you will be faced with technical, intellectual and logistical challenges, and I encourage you to make the most of your supervisors' expertise and the wider resource of knowledge distributed across the CDT.

If, at any time, you wish to contact the Centre regarding any issues or queries, please do not hesitate to get in touch either with the Centre Manager or myself, using the cdtphotonics@hw.ac.uk email address.

I hope that you will find your time in the CDT programme to be highly stimulating, enjoyable, and productive.

Professor Derryck T. Reid

Director

EPSRC Centre for Doctoral Training in Applied Photonics

2. Key Contacts

The CDT office shared email account CDTPhotonics@hw.ac.uk is monitored by the CDT support team which includes the Centre Administrators, Centre Manger and Training Programme Manager.

2.1 Executive

Prof. Derryck Reid
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2.2 Coordinators

University of Dundee	Dr. Keith Wilcox	K.G.Wilcox@dundee.ac.uk
University of Edinburgh	Dr. Phillip Hands	Philip.Hands@ed.ac.uk
University of Glasgow	Prof. Martin Lavery	Martin.Lavery@glasgow.ac.uk
University of St Andrews	Prof. Graham Turnbull	gat@st-andrews.ac.uk
University of Strathclyde	Dr. Gordon Flockhart	Gordon.Flockhart@strath.ac.uk

2.3 Student Representatives

CDTAP student representative	David Webster

2.4 Centre Contact Details

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Telephone: +44 (0)131 451 8245

Email: CDTphotonics@hw.ac.uk

Website: CDTphotonics.hw.ac.uk

Twitter: @CDTAP

LinkedIn: www.linkedin.com/groups/2497044/

3. EPSRC Centre for Doctoral Training in Applied Photonics

The Centre for Doctoral Training (CDT) in Applied Photonics is a collaboration between Heriot-Watt University and the universities of Dundee, Edinburgh, Glasgow, St Andrews, and Strathclyde, as well as our industrial partners. The Centre is managed by Heriot-Watt University.

Research projects are offered across the full range of applied photonics technologies, including Industrial Imaging and Visualisation; Photonic Sensing and Metrology; Computationally Assisted Imaging and Sensing; Device Technologies for Photonic Imaging and Sensing.

Graduates from the programme will have gained an in-depth knowledge of the fundamentals of their chosen specialism, as well as a comprehensive understanding of essential business and management issues, and how these are applied in industry.

3.1 Engineering Doctorate (EngD) and Doctor of Philosophy (PhD)

Our students follow a doctoral programme leading to the award of the degrees of Doctor of Engineering (EngD) or Doctor of Philosophy (PhD).

Our students take master level taught courses and follow a professional skills programme, with a quarter of the time spent on taught course work and the remainder on research.

Most of our EngD students spend 38 months of their 48 months of study undertaking their research project in the premises of their industry sponsor, with our PhD students working in the university of their academic supervisor.

The Engineering Doctorate (EngD) scheme was established by the Engineering and Physical Sciences Research Council (EPSRC) in 1992, as 'its flagship postgraduate qualification'. It is a four-year doctoral degree, with an emphasis on research in a business context, with the aim of delivering the senior research managers of the future.

3.2 Equality, Diversity, and Inclusion Statement

Please click on the following link to see our Equality, Diversity, and Inclusion Statement: https://bit.ly/2XmV9h4

3.3 Programme Structure

The programme duration is four years. All students study 180 credits of postgraduate technical and business courses (SCQF Level 11 NQF/QCF Level 7). Normal entry is in September, with core technical courses delivered in two residential blocks, the first from September to December and the second from January to May. Each block comprises a set of mandatory and elective courses.

Selected courses are available in distance-learning format, allowing for flexible working and for company employees to avoid spending large amounts of time offsite. For courses starting September 2021, we will be continuing to follow a blended learning approach for many of our modules where it is possible to teach remotely.

Students progress to their research project in June, with EngD projects located at the company's site and PhD projects being based in one of the six universities. The remaining taught courses are business oriented and are delivered at Edinburgh Business School on the Heriot-Watt campus. These are delivered in several 1-week intensive blocks in years two and three.

Students meet regularly for professional and computational skills workshops, delivered by the partner Universities and external facilitators.

3.4 Committees

Course Committee

The Course Committee, includes representatives of the academic partners, has oversight of the implementation and development of the accredited and professional-development training programme, and the operational aspects of student admission and progression.

Management Committee

The CDT Management Committee meets every 6 months, approximately June and November each year. The Committee's remit is to provide oversight and strategic input to the CDT Executive and to maintain a strong connection between the CDT and its industrial partners. CDT students have representation on this committee.

Independent Advisory Committee

The purpose of the Independent Advisory Committee is to provide external perspective to the CDT by drawing on expertise from the international photonics community and other nationally funded CDTs.

3.5 Enrolment

Enrolment takes place each year during September. EngD and PhD researchers registered with the universities of Dundee, Edinburgh, Glasgow, St Andrews, or Strathclyde as their home institution must also register with Heriot-Watt University as a non-graduating student. This is so that they maintain access to IT facilities and email.

3.6 Key Dates

A list of key dates for each academic year will be available and published on the CDT website (see link below). Students will be informed by email of dates, but please check the link as it will be updated regularly and provides an overview.

https://cdtphotonics.hw.ac.uk/event/key-dates-for-2021-22/

4. Taught and Professional Skills Courses

4.1 Taught Coursework

The programme is four years, with 25% of study time spent on taught coursework and 75% based on project work. The list of mandatory and taught courses is available on the CDT website at the below link.

https://cdtphotonics.hw.ac.uk/the-programme/

4.2 Personal Learning Plan

Your Personal Learning Plan (PLP) is a useful tool to help you plan your first year on the CDT in Applied Photonics programme. It should also help you to agree an engagement plan for the rest of your time on the programme. Keeping in regular contact with your supervisors and the CDT is paramount to ensure that your research keeps on track and that you have sufficient support.

You will be issued your PLP before your start date. This will prompt communication with your supervisors about which courses you would like to take in your first year (you will be able to amend this at a later stage if you wish). It will also get you thinking about your project and to agree a communication plan between you and your supervisors.

4.3 Options for a non-standard taught course route

The taught-course programme provides a mechanism for broadening your exposure to subjects which may not be covered within your research project but are nevertheless important to providing you with a broad perspective of key topics in applied photonics. Not only this, but the time spent with other students during the taught-course programme plays an important role in developing your professional network within the CDT cohort.

Options for a non-standard taught-course route may be available in exceptional cases for those CDT students who:

- Have a Masters degree which covers core modules from the programme.
- Are pursuing a project in the interface with another discipline.
- Are company employees prior to starting the programme and require access to alternative courses suitable for distance learning study.

CDT students who wish to discuss alternative taught courses should contact the CDT Office.

4.4 Approved Prior Learning (APL) Credit Exemptions

If you have completed a relevant MSc programme or course you may be eligible to request an exemption of up to 75 credits for accredited prior learning (APL). All applications must be approved by the CDT and by the Research Degrees Committee at Heriot-Watt University. APL application forms are in your Personal Learning Plan.

4.5 Taught Course Average and Resit Examinations

You will be awarded credit for any course for where you obtain at least 50%. A credit-weighted average of at least 50% is necessary to be eligible for the award.

Resit examinations may be necessary either to increase your credit-weighted average to at least 50%, or to obtain credit in any courses in which you have obtained below 50%. All students are offered standard reassessment opportunities, as determined by the institution delivering the course. Please consult your academic supervisor or the CDT Office if you need advice.

4.6 Edinburgh Business School (EBS) courses

If you choose to defer an EBS examination you are required to inform the CDT office at least 4 weeks before the date of the exam, failure to do will result in you being liable for the £140 exam rearrangement fee.

If you fail an EBS exam you will be required to pay a £140 resit examination fee. Both the above fees are paid directly to EBS.

It is particularly important that sufficient time is allowed for the coursework which is completed by distance-learning after the project work has commenced. Each EBS course should take about 200 hours of work to complete in total, including attendance in the introductory seminar week, revision classes and examinations. For a single business course spread over a 3-month period up to one day per week may be required. Therefore, you need to therefore construct your working day or week accordingly to allow sufficient time for this. You should be allowed time within normal working hours to carry out this coursework.

4.7 Professional Skills Courses

The below tables indicate the courses you should receive each year and an overview of their content. More detailed agendas for each courses will be sent to you closer to the time along with travel information or links if it is an online course.

Due to the Covid-19 pandemic all of our skills courses were moved online for the academic year 20/21. In addition to this some courses that could not be moved online were paused to be rescheduled, or temporarily replaced with another course that focuses on a similar skill set. We anticipate that this will remain the case for at least semester one of the academic year 21/22 and will give you advanced notice of all your course dates and method of delivery.

Year 1

Course	Content
Academic Communication 1: Writing a Literature Review	This course will cover how to write and structure an effective literature review. The workshop will cover grammar, style, and tone as well as planning.
Equality and Diversity Awareness	Delivered by Equate Scotland, the national expert on gender quality in STEM. The aims of this workshop are to challenge unconscious bias and to promote benefits of diversity. It will also make students aware of their rights and obligations. The workshop will cover unconscious bias; micro-inequalities and intersectionality; being the manager of tomorrow and leading on equality; equality and diversity thinking in a STEM environment.
Health and Wellbeing	This workshop will focus on techniques to manage stress and take care of your mental health and wellbeing. This course is delivered by Heriot-Watt University Support Services.
Responsible Research and Innovation (RRI)	Delivered by Orbit. The aims of this workshop will be to familiarise students with the key principles of RRI. The workshop will cover the foundations of RRI and a detailed analysis of the AREA framework (Anticipate, Reflect, Engage, Act). Students will also develop a reflective action plan and will be supplied with online support following training.
Six Sigma	Delivered biennially in first or second year. The workshop will introduce students to the power of Six Sigma and the impact it can have on improving processes. This practical session will cover case studies, tools, and research applications.

Year 2

Course	Content
Academic Communication 2: Effective conference presentations	Delivered by Electiv. This course develops presentation skills to deliver effective conference talks, posters and how to communicate research in a professional manner.
Six Sigma	Delivered biennially in first or second year. The workshop will introduce students to the power of Six Sigma and the impact it can have on improving processes. This practical session will cover case studies, tools, and research applications.
Intellectual Property	Delivered by patent and trademark attorneys with backgrounds in photonics, chemistry, and biochemistry. The workshop examines IP from the perspective of the inventor or technologist, covering IP, copyright designs and patents.
Quality Management	Delivered by industrial partners with expertise in managing quality. This workshop will comprise of case studies and real-world examples.
Digital Outreach	Delivered by Glasgow Science Centre, this workshop aims to develop confidence and understanding of digital tools and techniques to promote research to a general audience. It will also cover how to promote research using social media and multi-media tools to present research online.

Year 3

Course	Content
Academic Communication 3: Academic Journal and Paper Writing	This workshop will develop students' academic writing skills. This will cover effective planning and writing a journal paper including style, tone, and structure.
Outreach and communicating with the public	Delivered by Glasgow Science Centre, this workshop aims to develop confidence in explaining research to a non-expert audience. This workshop will cover effective outreach strategies, how to capture the essence of research work and practical approaches that work. This will cover two days, preparation and delivery.

Year 4

Course	Content
Academic Communication 4: Thesis Preparation and Writing	This workshop will build on writing skills, grammar, structure, and tone. It aims to develop students' analytic, written, and presentational skills to professional academic level.
Proposal Writing and Entrepreneurship	This course introduces students to concepts associated with commercialising their research. The syllabus with involve Lean Model Canvas, technology translation, finance and investment, product design and pitching.

5. Research Project

The research project work forms the major part of EngD and PhD qualifications. It is conventional for PhD research work to consist of a single topic, whereas an EngD degree may consist of a single topic but can also comprise several shorter projects. As research, it must involve 'knowledge creation'. This may be in the application of known techniques to solve new problems, creating knowledge about the associated engineering issues, as well as more fundamental work.

You have two supervisors for this project work: an industrial supervisor from your host company and an academic supervisor from your host university. Your project is defined and led by the company, and typically your primary (day-to-day) supervisor will be your industrial supervisor, with input provided from your academic supervisor on a less frequent basis.

5.1 Dissemination

Knowledge is only useful if it is disseminated to others, and this dissemination activity is an important part of the programme. It is expected that during the programme, you will publish at least one paper in a refereed journal, and present at least one paper at a suitable international conference. In some cases, commercial confidentiality considerations may restrict this (although often it is possible still to publish if certain key details are omitted). If external dissemination is not possible, then work should be disseminated in internal company reports. Dissemination can also be by the patent application process.

5.2 Planning

Your plans should project at least one year ahead, including deliverables, milestones, and plans for dissemination. These plans should be agreed with both your academic and industrial supervisors.

You should maintain a project plan, including a Gantt chart and a summary of the project plan should be included with your annual report.

5.3 Quarterly Reviews

The EPSRC guidelines mandate regular meetings between you and your academic and industrial supervisors. You will be asked to complete quarterly project reviews from year two onwards. At least two of these meetings per year must be face to face with both supervisors.

You are responsible for organising quarterly review (QR) meetings, recording the actions, main discussion topics, outcomes, and decisions. Academic and industrial supervisors have a responsibility to make themselves available for progress meetings on a quarterly basis.

Review meetings should be formally recorded, and it is your responsibility to ensure that all sections of the review form are considered during the meeting. Detailed minutes are not necessary; the idea is simply to record key discussion points, decisions, and actions.

A template for recording progress meetings is available on the Vision site, which can be accessed by all CDT Students. This should be completed during the meeting and returned to the CDT office after the meeting. Quarterly deadlines for the submission of completed forms to the office are 31 March, 30 June, 30 September, and 31 December. However, a review meeting can take place any time in the three months preceding these dates.

5.4 Annual Appraisal

You will have an appraisal in June each year in which your progress will be reviewed by the CDT. For this appraisal you will be sent a template form and instructions by the CDT office. Your supervisors will then review your report and complete a Supervisor Report Form. All the documents are used to form the basis of the annual appraisal meeting performed by independent academics associated with the programme.

5.5 Supervision

In addition to the review process described above, it is important that you maintain regular contact with your academic and industrial supervisors. The nature of this contact will vary, dependent on the practices of the individuals involved, and the nature of the project work. As a guide, you should ensure that you contact both supervisors at least once a fortnight - this may be in the form of a face-to-face meeting, telephone meeting, or email correspondence.

5.6 Intellectual Property Rights (IPR) and Collaboration Agreement

A Collaboration Agreement, covering IPR and Finance, must be signed by the CDT student, the company, and the host university.

5.7 Thesis/Portfolio Submission

You should submit your thesis by the end of the 4-year funding period. If there are extenuating circumstances, an unfunded extension may be granted on application to your host university.

Details of thesis submission for Heriot-Watt students can be found on the Academic Registry website: Thesis examination - Heriot-Watt University (hw.ac.uk)

If you are registered as a student at one the partner Universities (Dundee, Edinburgh, Glasgow, St Andrews, or Strathclyde), you should consult the regulations of your appropriate institution for thesis submission.

6. Finance and Travel

6.1 Financial Arrangements

Funding is provided by EPSRC, and managed by the CDT office, together with a contribution from your host university and top-up funding from the company sponsor.

Stipends are paid to you by your host institution which is the university at which your primary academic supervisor is based.

Funding is provided for a period of 48 months, however if you submit your initial thesis before 48 months, funding will stop at the end of the financial quarter in which you submit your initial thesis. For example, if you make your initial submission in February, then payments can continue until the end of March, when the financial quarter ends.

If you leave the programme early, you are required to repay any advance funding. If you start full-time employment before submitting your thesis, you are no longer eligible to receive a stipend.

CDT students who are company employees will not receive a stipend and continue to receive their pay as per their company terms and conditions.

6.2 Travel and Subsistence Budgets

Please refer to the CDTAP Student Travel and Accommodation Policy which can be found at Guidelines and Resources - CDT in Applied Photonics (hw.ac.uk)

7. Support and Standards

7.1 Professional Institutes and CEng Accreditation

It may be possible to obtain CEng accreditation through the Institute of Physics (IOP). The requirements for CEng accreditation through the IOP, as opposed to another professional body, are well matched to the programme process. Specifically, you do not need a BEng or MEng degree as a prerequisite.

If you are interested in applying for CEng via the IOP you should be able to use an edited version of your thesis as a key part of the evidence required.

In brief, the IOP asks for:

- a technical report of up to 10,000 words. From their guidance notes, a condensed version your thesis would be ideal.
- a professional report of up to 3,000 words, simply mapping your experience to the Engineering Council's 16 competencies.
- two supporters, both CEng holders.
- degree certificates, application form etc.

The IOP provide information about the requirements on their website: https://membership.iop.org/chartered-engineer-ceng

It can also help in finding a professional mentor for you. The CDT can help in this respect as well.

You should be aware that often it takes some time to build up a record of your experience and how you have met the Engineering Council's competencies. If you wish to work towards a CEng accreditation, you should begin building up a map of the professional competencies to your experience as early as possible.

Some of the CDT's larger industrial partners have a graduate training programme which embeds working towards satisfying the CEng competency framework. If this applies in your company, you should ask your industrial supervisor if you can access this component of their graduate training programme.

Typically there will be some remaining competencies (e.g. C3 Lead Teams and Develop Staff) which you will be unable to satisfy only on the basis of your CDT experience, however it will often be possible to meet these following a short period of relevant employment after graduation.

7.2 Problem Resolution

If problems arise with your project work during your time as a CDT Student, you should normally discuss these with your academic and industrial supervisors in the first instance. However, if resolution is not possible by this route, you should contact the Training Programme Manager.

A representative of all CDT Students attends bi-annual Management Committee Meetings, usually in June and November. If you wish to raise any issues at a management-level meeting, please feedback to the CDT Student Representative in advance of the meetings. You will be notified of your representative each year. If you wish to nominate yourself for this responsibility, please advise the Training Programme Manager.

7.3 Hours of work

The four years funding provided for the programme assumes students will average about 40 hours of work each week, including coursework. The hours in which this work is carried out needs to be agreed with your industrial

supervisor or academic supervisor, to fit in with the practices of the company or research group in which you are carrying out the work.

7.4 Annual Leave

Students are entitled to six weeks leave per year. Students are responsible for agreeing their proposed leave arrangements with their industrial and academic supervisors and providing their supervisors with sufficient advance notice of planned absences.

7.5 Absence

Any period of absence through illness or injury should be reported by the student to their Academic and industrial supervisors. If a student is prevented from working by illness for a continuous period of more than two weeks, they must inform the CDT Office immediately and submit a medical certificate. Please note that all absences from examinations require a medical certificate.

Payment of a Studentship will continue for absences covered by a medical certificate for up to 13 weeks within any 12-month period. If the illness lasts for more than thirteen weeks you must suspend the Studentship for the period beyond the 13 weeks.

7.6 Maternity, Paternity, Adoption and Parental Leave

UKRI funded students are entitled to 52 weeks of maternity or shared parental leave. The first 26 weeks should be paid at full stipend rate, pro-rated as necessary for part time students. The following 13 weeks should be paid at a level commensurate with statutory maternity pay. The final 13 weeks are not paid. Partners are entitled to up to 10 days paid Ordinary Paternity Leave on full stipend. Partners may be entitled to up to 50 weeks of Shared Parental Leave; this may include paid and unpaid leave, depending on the individual circumstances, any paid leave should be at full stipend. Adoption leave should be granted on the same basis as maternity leave. There is no qualifying period for maternity, paternity, adoption or shared parental leave. Additionally, the studentship end date should be updated to reflect the period of leave.

7.7 Early Exit

Should you wish to leave the programme, or should any of your supervisors feel that your progress is not sufficient to enable you to complete the programme successfully, you may be eligible to leave with an exit qualification. The exit qualification you would be eligible for depends on the stage at which you leave the programme, the number of courses you have successfully completed, and the level and depth of the research you have undertaken.

You will be required to return any library books or course materials, and you may be required to return a portion of your funding and pay any outstanding university debts.

7.8 Support Offices

Your health and well-being are important, and we understand that during your time on the programme you may find your circumstances change. If at any time you need additional support, please contact the Training Programme Manager. Your supervisors and key contacts are also here to help. Your information will be treated sensitively.

To support you during your time on the programme there is a wide range of services available at your institution; details of these are below. If you find you need support, please make use of these services.

Heriot-Watt University: www.hw.ac.uk/students/health-wellbeing.htm

University of Dundee: www.dundee.ac.uk/student-services

University of Edinburgh: www.ed.ac.uk/students/health-and-wellbeing

University of Glasgow: www.gla.ac.uk/study/studentlife/support

University of St Andrews: www.st-andrews.ac.uk/students/advice

University of Strathclyde: www.strath.ac.uk/sees/studentsupportwellbeing

7.9 Postgraduate Code of Practice

You are required to abide by the regulations of your host university and conform with its Policies, Procedures, Ordinances and Regulations.

The following web links are to the Postgraduate Research Code of Practice or equivalent for your host institution. You should confirm with your academic supervisor if you have any further codes of practice that you should adhere to at your institution.

Heriot-Watt University: https://bit.ly/2Jxvxas

University of Dundee: https://bit.ly/39KBvAA

University of Edinburgh: https://bit.ly/2Y4KXez

University of St Andrews: https://bit.ly/2PdsGWo

University of Glasgow: https://bit.ly/2LsQTIz

University of Strathclyde: https://bit.ly/3giDuyb

8.10 Roles and Responsibilities

The CDT in Applied Photonics is a partnership between industry and academia, with the collaboration between CDT students, academic and industrial supervisors central to this. These roles and responsibilities have been developed in collaboration with CDT students, academic and industrial supervisors to provide guidance best practice in each of the roles.

CDT Students

Best Practice

- Adhere to the rules and regulations of your host institution (resources, working hours etc.).
- Take ownership in the detailed planning and scheduling of your project, including the identification of objectives, timescales, milestones, and deliverables.
- Research current knowledge and keep literature review up to date.
- Manage your time and budget effectively to complete your research and fulfil your commitments.
- Organise Quarterly Reviews and use them to raise issues and guide progress.
- Meet deadlines set by the CDT.
- Keep a record of your work through lab books and internal reporting.
- Inform your supervisors and the CDT in a timely fashion if you are experiencing any difficulties.
- Commit to learning for taught courses and professional skills workshops.
- Seek out opportunities to further your skills.
- Participate in outreach activities.
- Facilitate regular contact between industrial and academic supervisors.
- Act as a respectable and responsible ambassador for the CDT.
- Attend CDT Conferences and Summer Schools.
- Disseminate your work to the wider scientific community.
- Acknowledge EPSRC in any publications or presentations.
- Adhere to the Travel Expenses Policy. Guidelines of which can be found in this document and on Vision.

Things to Avoid

- Taking periods of absence without informing supervisors and the CDT office.
- Becoming isolated from supervisors and the CDT office.
- Leave writing your thesis until the last minute.

Academic Supervisors

Best Practice

- Support the student in reaching the appropriate level of academic rigour in their research e.g. in their quality of writing, literature reviewing and research methodology.
- Provide input to the research e.g. things to try, papers to read, introductions to useful contacts.
- Act as a channel to the offices and processes of the student's host university e.g. by facilitating the nomination of thesis title, thesis examiners, submission of thesis etc.
- Participate in Quarterly Reviews i.e. minimum 6-monthly in-person visits to the company and minimum 3-monthly conversations joint (phone or face-to-face) with the student and industrial supervisor.
- Engage with the student between Quarterly Review meetings e.g. phone call/Skype/email update at least monthly.
- Proofread the student's draft papers, conference submissions and thesis.
- Encourage the student to publish by suggesting suitable journals and helping them negotiate IP issues.
- Use your £14K budget to engage with the student (e.g. travel to the company). Once these commitments are covered, you may use the budget for any legitimate research expenditure.
- Brief the external examiner about the differences in nature between PhD and EngD theses and the corresponding differences in the expected outcomes.
- Attend supervisor training sessions.
- Provide timely feedback.
- Support the student in the wider skills training programme of the CDT.

Things to Avoid

- Directing the research programme, unless with the agreement of the company.
- Expecting to appear on all articles or conference submissions, where a significant practical or intellectual contribution has not been made.
- Exceeding £14K total expenditure, even if there appears to be more money in the budget, since the other funds are used to pay the student stipend.

Industrial Supervisors

Best Practice

- Make introductions to allow the student to quickly feel at home in the company.
- Facilitate any training required by the student.
- Ensure the student is sufficiently resourced (office/lab accommodation; consumables; IT).
- Provide an industrial research vision for the project.
- Allow sufficient scope for the student to generate new knowledge with a breadth and depth sufficient to support a doctoral thesis.
- Agree and regularly review a project plan with the student.
- Work with the student and academic supervisor to navigate barriers to publication consensually.
- Participate in quarterly reviews i.e. host the academic supervisor for minimum 6-monthly in-person visits to the company and holding minimum 3-monthly conversations joint (phone or face-to-face) with the student and academic supervisor.
- Contribute to proofreading the student's draft papers, conference submissions and (of course) thesis.
- Attend supervisor training sessions.
- Provide timely feedback.
- Support the student in the wider skills training programme of the CDT, noting they occasionally will need to be absent from the company for skills training and business-school exams.
- Promote the CDT inside and outside the company.
- Attend the CDT annual conference, where possible.

Things to Avoid

- Deploying the student on non-research work, unless in exceptional circumstances and for a short period.
- Embargoing publication of research results unnecessarily.