UNIVERSITY OF LEICESTER

**Programme Specification (Postgraduate)**
**For students entering in 2019/20**
**Amended 30/04/2019**

1. **Programme Title(s):**
   MSc in Aerospace Engineering
   MSc in Aerospace Engineering with Industry
   Postgraduate Diploma (PGDip) in Aerospace Engineering (exit award only)
   Postgraduate Certificate (PGCert) in Aerospace Engineering (exit award only)

   HECOS Code

| HECOS CODE | % |
|---|---|
| 100115 | 100 |
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2. **Awarding body or institution:**
   University of Leicester

3. **a) Mode of study**
   MSc in Aerospace Engineering: Full time or part-time.
   MSc in Aerospace Engineering with Industry: Full time.
   With Industry: The taught modules would all be taken in the first two semesters. This is followed by the industrial placement, which is between 3 and 12 months long, and would be taken following the end of the first year May/June exam period. This is followed by the in-house project, taking 10 weeks.

   **b) Type of study**
   Campus-based (taught modules and project)
   With Industry: The Industrial placement is off campus, on the site of the Placement Provider.

4. **Registration periods:**
   MSc in Aerospace Engineering:
   For the full time: the normal period of registration is 12 months, and the maximum is 24 months.
   For part-time:the normal registration period is 24 months and the maximum is 48
   MSc in Aerospace Engineering with Industry:
   The normal period of registration is 24 months. The maximum period of registration is 33 months.

5. **Typical entry requirements:**
   Candidates should have at least a good second-class honours degree in Aerospace Engineering, Mechanical Engineering, or a related Engineering subject, from a British University or its equivalent; or a qualification recognised by the University as equivalent.
   Candidates whose first language is not English will be required to provide evidence of appropriate language skills according to the current university language requirements for Engineering:
   https://le.ac.uk/study/research-degrees/entry-reqs/eng-lang-reqs

6. **Accreditation of Prior Learning:**

No accreditation of Prior Learning is normally considered.

**7. Programme aims:**

This course will provide the knowledge and skills required of a professional engineer to work in aerospace technology. The content is organized in four themes: "Control Engineering", "Fluid Dynamics", and "Mechanics of Materials" which are core aerospace technology themes, plus an optional "Systems Engineering" theme.

For the with industry variant only, these additional programme aims apply:

- Prepare students for career and training opportunities which relates to their degree – in both the private and public sectors, and voluntary organisations.
- Construct effective applications for placement opportunities
- Provide students the opportunity to recognise suitable plans for transitioning into the workplace

**8. Reference points used to inform the programme specification:**

- Engineering Accreditation Board (EAB) Masters Degree other than Integrated Masters, and EngD Learning Outcomes (AHEP 3rd Edition)
- UK-SPEC (UK Standard for Professional Engineering Competence)
- Engineering Council Compensation and Condonement requirements November 2018.
- QAA Characteristics Statement, Master's Degree, 2015.
- QAA Subject Benchmark Statement, Engineering, 2015.
- Engineering Annual Developmental Review 2016/17
- University Learning Strategy
- University Employability Strategy 2017/21
- External Examiner's Reports

**9. Programme Outcomes:**

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| ***(a) Subject and Professional skills*** | | |
| **Knowledge** | | |
| Recall and describe fundamental tools in Control Engineering, Fluid Dynamics, Mechanics of Materials, and Systems Engineering and their role in Aerospace Engineering.<br><br>With Industry: apply knowledge acquired to real world scenarios, through the industrial placement. | Lectures, specified reading, lab classes, design exercises, project supervision and execution.<br><br>With Industry: Placement preparation and supervision | Modules examinations, lab reports, design exercises and course work reports, project dissertation.<br><br>With Industry: Placement assessment and reports. |
| **Concepts and Techniques** | | |
| Explain and apply robust control concepts and linear and nonlinear techniques to solve control design problems.<br><br>Explain computational design concepts and implement simulations of flows.<br><br>Explain materials design concepts and implement selection and testing of materials.<br><br>Explain and apply systems engineering concepts to aerospace engineering design problems.<br><br>Apply state-of-the-art design and simulation for control system design and simulation of flows. Apply of a variety of materials and engineering design tools.<br><br>With Industry: Practical experience in the application of engineering techniques acquired in the course to real world scenarios, through the industrial placement. | Lectures, specified reading, lab classes, design exercises, project supervision and execution.<br><br>With Industry: Placement preparation and supervision | Modules examinations, lab reports, design exercises and course work reports, project dissertation.<br><br>With Industry: Placement assessment and reports. |

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| **Intended Learning Outcomes** | **Teaching and Learning Methods** | **How Demonstrated?** |
| **Critical analysis** | | |
| Analyze typical problems and requirements in Aerospace Engineering and identify the appropriate concepts and techniques among those acquired in the course.<br><br>Critically appraise solutions to different aerospace design problems.<br><br>Asses and evaluate critically results presented in the technical literature. | Lectures, specified reading, lab classes, design exercises, project supervision and execution. | Modules examinations, lab reports, design exercises and course work reports, project dissertation. |
| **Presentation** | | |
| Present clearly and concisely own analysis and results<br><br>Participate to discussion in a constructive manner.<br><br>With Industry: report key responsibilities and achievements from their placement | Lab classes, supervision of design exercises, project supervision and execution. Optional in-sessional English classes.<br><br>With Industry: Placement preparation and supervision | Lab reports, design exercises and course work reports, project dissertation.<br><br>With Industry: Placement assessment and reports. |
| **Appraisal of evidence** | | |
| Evaluate the results of design cases in each of the course disciplines and judge if the results met the initial requirements.<br><br>With Industry: evaluate critically their impact and results achieved in the workplace environment. | Lab classes, supervision of design exercises, project supervision and execution.<br><br>With Industry: Placement preparation and supervision | Lab reports, design exercises and course work reports, project dissertation.<br><br>With Industry: Placement assessment and reports. |
| ***(b) Transferable skills*** | | |
| **Research skills** | | |

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| Perform reviews of the technical literature.<br><br>Demonstrate laboratory skills.<br><br>Perform data analysis. | Lab classes, supervision of design exercises, project supervision and execution. | Lab reports, design exercises and course work reports, project dissertation. |
| **Intended Learning Outcomes** | **Teaching and Learning Methods** | **How Demonstrated?** |
| **Communication skills** | | |
| Write concise and accurate reports.<br><br>Participate to discussion in a constructive manner.<br><br>With Industry: Communicate effectively in a modern industrial environment. | Lab classes, supervision of design exercises, project supervision and execution. Optional in-sessional English classes.<br><br>With Industry: Placement preparation and supervision | Lab reports, design exercises and course work reports, project dissertation.<br><br>With Industry: Placement assessment and reports. |
| **Data presentation and IT** | | |
| Use effectively a variety of IT tools for design, and data analysis and presentation. | Lab classes, supervision of design exercises, project supervision and execution. | Lab reports, design exercises and course work reports, project dissertation. |
| **Working relationships** | | |
| Manage and present progress on a project.<br><br>Participate to teamwork in a constructive manner.<br><br>With Industry: communicate professionally through selection processes and networking opportunities. | Project supervision and execution.<br><br>Lab classes.<br><br>With Industry: Placement preparation and supervision | Project dissertation.<br><br>Lab reports.<br><br>With Industry: Placement assessment and reports. |
| **Managing learning** | | |
| Manage time and work independently | Tutorials, Induction sessions, project supervision and execution. | Modules examinations, lab reports, design exercises and course work reports, project dissertation. |
| **Career management** | | |

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| Write a professional curriculum and exploit networking opportunities.<br><br>With Industry:<br>1. Select appropriate resources for researching/securing placement opportunities<br>2. Explain the process for applying for and securing a relevant placement<br>3. Construct effective applications for placement opportunities<br>4. Recognise suitable plans for transitioning into a placement<br>5. Apply the theoretical and practical aspects of the material studied at the University and demonstrate the personal and professional skills necessary for your role within the organisation.<br>6. Compose a Professional Development Plan considering your strengths, development areas and motivations for your next step<br>7. Modify your CV to include the skills and experience you have gained through your significant experience gained in the past 12 months | Tutorials. Optional university career development events<br><br>Placement preparation 1 & 2:<br><br>Students are provided with dedicated and timetabled sessions to prepare to search and secure an industrial placement.<br><br>Problem solving classes, Masterclasses, Career development programmes, Independent research.<br><br>On placement:<br><br>Students undertake a minimum of 3 months experience in the workplace.<br><br>Project supervision, independent research | Tutorials feedback and interactions with career development services.<br><br>Formative module feedback through session tasks and exercises<br><br>Completion of Monthly Reflective Journals to record skills development, major achievements, key areas of work, learning points and challenges overcome.<br><br>Assessed by a Placement Portfolio, comprising of a Reflective Summary, Professional Development Plan, and Updated CV (excluded from word count) to formally assess on a pass or fail basis.<br><br>Formative feedback during a Placement Visit (in person or via Skype) from Placement Provider and Placement Tutor regarding reflection on skills development, areas of strength and weakness and contribution to the workplace. |

**10. Special features:**

This course is not accredited yet. The course will be submitted for accreditation, with a retroactive effect, at the first available opportunity, after the first cohort of students has completed the course. All modules of the MSc in Aerospace belong also to other MSc courses which are currently accredited, and award rules are consistent with other MSc programmes and the accreditation requirements in preparation for seeking accreditation.

With Industry:

(i) After completing the eight taught modules and exams in the first year of the course, students will carry out between 3 and 12 months employment in an industrial placement. Students will be encouraged to undertake the maximum period of employment possible, to gain the full benefit of experience in industry.
(ii) On the return from an industrial placement, the Placement Student will carry out an in-house project in the School or Department, as per the normal non-Industry MSc The project will be supervised and assessed within the Department. The project title will be decided, in conjunction with the Placement Student, while they are on placement.
(iii) During the industrial placement, appropriate support will be provided by the School or Department as defined in the Code of Practice.
(iv) Placement Students will be expected to complete a Monthly Reflective Journal to record their training. This will support the Placement Student to complete the Placement Portfolio which is assessed on a pass/fail basis, and will have no credit weighting in the MSc.
(v) Placement Students who do not pass the assessment or meet the minimum duration of an industrial placement will receive the standard MSc degree.

## 11. Indications of programme quality:

The programme is subject to all normal departmental, college and institutional academic quality assurance processes.

It is the student's responsibility to secure an industrial placement. Students are invited to attended Placement Preparation modules, additional support workshops and 1-2-1 appointments with the Career Development Service. Employer led activities provide a platform for students to engage with organisations who are recruiting students for year in industry roles.

The 'with Industry' MSc relies on the Placement Provider to provide work suitable for an MSc student. To ensure the role is relevant, the School or Department assesses the industrial placement through the University's Placement Approval Process. The Placement Provider will be asked to provider:

- An indication of the area of the organisation where the Placement Student will work.
- An indication of the area of expertise that the Placement Student should have or will gain.
- Whether the work is suitable only for a UK national, for and EU national or for an overseas student.
- The resources available to the Placement Student. For example, design software, textbooks, laboratory equipment, product specimens, access to facilities in the organisation.
- Identification of a suitable industrial mentor (i.e. a graduate with knowledge of the area and at least a couple of years of experience in the field).

When a Placement Student starts an industrial placement, they will be required to complete health and safety documents and confirm they have completed a formal induction process no later than the 2nd week of placement.

Placement Students will be provided with a Study Guide for their industrial placement and support them to complete the assessment. The School or Department will undertake a placement start check, regular communications, visits to the workplace (physical and/or virtual) and evaluation. Communication and contact between the Placement Student, Placement Provider and University provides support should issues arise.

## 12. Scheme of Assessment

As defined in Senate Regulation 6: Regulations governing taught postgraduate programmes of study.

The following additional award requirements for this programme have been approved:

- This programme follows the Scheme of Assessment for Master degree programmes with a structure of 120 credits of taught modules and a project of 60 credits, with the variation (required by the Engineering Council for accreditation purposes) that a maximum of 15 credits may be failed at grade D (40-49%) and no credits failed at grade F (0-39%). Students who fail to meet this criterion will be considered for an interim award based on the taught component of the programme.
- A student who successfully completes an industry placement but does not meet the award requirements for an MSc may be considered for the exit award of PGDip with industry.

## 13. Progression points

As defined in Senate Regulation 6: Regulations governing taught postgraduate programmes of study.

The following additional award requirements for this programme have been approved:

A Placement Student will revert back to the degree without Year in Industry if:

1. At the semester 1 exam board, they have less than one module at merit level and any failed modules at <50%. No progression rule is applied at the semester 2 exam board. In the case of failed modules with mitigating circumstances, the semester 1 board will use its discretion.
2. They fail to secure an industrial placement role.
3. They fail to pass the assessment related to the industrial placement.
4. The industrial placement ends early due to the behaviour of the Placement Student not being in accordance with the University's Regulations for Students, Student Responsibilities. The Placement Student will need to return to the University and carry out an in-house project in the School or Department, as per the normal non-Industry MSc. To prevent such an incident from happening, processes are in place to identify any possible issues or concerns early in the industrial placement role. This includes a start check, regular communications, visits to the workplace (physical and/or virtual) and evaluation. Communication and contact between the Placement Student, Placement Provider and University provides support should issues arise.
5. They discontinue their industrial placement and carry out an in-house project in the School or Department, as per the normal non-Industry MSc.

In the event that a Placement Student is moved to the standard campus-based MSc, the Placement Provider will be notified immediately. For overseas students, the UKBA will also be informed immediately. Placement Provider's will be made that any contract of employment shall be made subject to satisfactory completion of the taught part of the MSc.

Three months is the minimum time required for an industrial placement to be formally recognised. If the industrial placement is terminated earlier than 3 months as a result of event outside of the Placement Students control (for example redundancy, or company liquidation), the following process will be adopted:

1. If the Placement Student has completed less than 2 months, they will be supported to search for another placement to take them up to the required minimum of 3 months for the industrial placement to be formally recognised. If the Placement Student does not find a placement to meet this criteria they will be required to suspend and transferred onto the degree without industry.
2. If the Placement Student has completed 2 months, they will be supported to search for another placement to take them up to the 3 months required for the industrial placement to be formally recognised. If the Placement Student cannot source an additional placement to take them to 3 months, assessments related to the industrial placement will be set for the student to make it

possible for the individual learning objectives for the industrial placement to be met. This will allow with industry to be recognised in the degree certificate.

3. The duration of time between the two Placement Providers to meet the minimum 3 months of an industrial placement must not exceed the period of time required to comply with visa requirements.
4. A Placement Student is permitted to undertake an industrial placement which runs across two academic years.

**14. Rules relating to re-sits or re-submissions:**

As defined in Senate Regulation 6: Regulations governing taught postgraduate programmes of study.

**15. Additional information** [e.g. timetable for admissions]

**16 External Examiner**

The details of the External Examiner(s) for this programme and the most recent External Examiners' reports are available upon request.

**Appendix 1: Programme structure** (programme regulations)

## Year 1

**Semester 1**

| | Credits | |
|---|---|---|
| EG7010 Engineering Design Case Study | 15 | Sem 1 |
| EG7026 Advanced Fluid Dynamics | 15 | Sem 1 |
| ADEG7221 Placement Preparation 1* | 0 | Sem 1 |
| | | |
| Choose two from: | | |
| EG7015 Robust Control | 15 | Sem 1 |
| EG7037 Advanced Solid Mechanics | 15 | Sem 1 |
| EG7411 Current Trends in Aerospace | 15 | Sem 1 |
| EG7412 Systems Engineering & Spacecraft Systems | 15 | Sem 1 |

**Semester 2**

| | | |
|---|---|---|
| EG7029 Computational Fluid Dynamics | 15 | Sem 2 |
| EG7031 Advanced Materials Modelling | 15 | Sem 2 |
| EG7038 Aerospace Materials | 15 | Sem 2 |
| EG7040 Nonlinear Control | 15 | Sem 2 |
| ADEG7222 Placement Preparation 2* | 0 | Sem 2 |
| EG7020 Individual Project (**) | 60 | Sem 2/Summer |

(*) are only in the "with Industry" programme
(**) EG7020 is in Year 2 in the "with Industry" programme

**Year 2 (with Industry only)**

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|---|---|---|
| ADEG7223 On Placement* | 0 | Semester 1&2 |
| EG7020 Individual Project | 60 | Sem 1/Sem 2/Summer |

* The "with industry" programme includes an industrial placement of 3-12 months, following the end of the first year May/June exam period, with students returning to UoL to complete the project/dissertation after their placement.

**Appendix 2: Module Specifications**

See module specification database http://www.le.ac.uk/sas/courses/documentation