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## International Project Week for Interdisciplinary Research-Oriented Digital Learning

### Summer 2020 | Syllabus for International Participants

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|------------------------|--|---|
| <b>TOPIC</b>           | <b>Interstellar Re-Factory</b>   |   |
|                        | Design of a multifunctional and flexible system ensuring sustainability of off-world travel and space exploration: re-cycling, re-finishing, re-engineering, and re-deployment of organic and inorganic resources. |   |
| <b>LANGUAGE</b>        | English  |   |
| <b>PREREQUISITES</b>   | Enrolled in a university undergraduate or graduate program<br>General interest in Engineering & Life Sciences<br>and studying abroad   |   |
| <b>COURSE SCHEDULE</b> |  |   |
| <b>Prep-phase</b>      | e-Learning, home country   |   |
| Launch                 | March 30   |   |
| Duration               | approx. 10 weeks   |   |
| Format                 | weekly content 'packages'  |   |
| <b>Do-phase</b>        | Darmstadt, Germany   |   |
| Duration               | 3 weeks  | June 15 – July 3  |
| Format                 | weeks 1 & 2  | project work in teams<br>& fundamental bio/engineering practicals |
|                        | week 3   | company visits<br>& tour of the European Space Operations Centre  |

#### COURSE DESCRIPTION

The so called Prep-phase, consisting in independent self-study of the e-Learning material made available *via* the open-source Moodle platform, is primarily designed to give the participants of disparate academic backgrounds an overview of the skills required for their interdisciplinary work in international teams. Task-relevant e-Learning content, addressing fundamentals and state-of-the-art practices of (synthetic) biology, materials science, and engineering, is posted online incrementally as the Prep-phase progresses.

In course of the Do-phase, comprising a two-week project event at TU Darmstadt, the students have the opportunity to experience project work in a typical (bio-)engineering environment. In international and interdisciplinary teams of 8 to 12 participants, they develop solutions to a challenging bio/engineering-based problem. Their team and project work is continuously supported by trained staff who promote professional and social learning, whereas specific science questions are addressed by senior faculty members and specialists during so-called 'Expert Interviews'. Concurrently, the students are afforded access to laboratories on the Bio-Campus and in the Materials Science Department as well as learning factories of the Department of Mechanical Engineering. The project event concludes with the presentation of teamwork results.

In the final week of their stay in Darmstadt, the participants have the opportunity to gain perspective on the practices of bio-/engineering companies based in Germany as well as the European Space Operations Centre (ESOC) and discuss their insights and impressions.

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**LEARNING OBJECTIVES**

On successful completion of the course, students will be able to:

- Develop a goal-oriented solution to a complex problem through interdisciplinary project work
- Comprehend and work on an interdisciplinary assignment guided by the driving tenets of synthetic biology, materials science, and product development principles of mechanical engineering
- Facilitate effective collaboration and moderate team dynamics
- Plan, organize, and carry out tasks independently
- Learn and apply project management skills, particularly agile project management
- Discuss possible solutions and reach informed decisions based on relevant criteria
- While future engineers will be able to perform basic biological experiments following relevant lab-safety guidelines, the students of Life Sciences/Biology will be afforded an insight into the development and implementation of straightforward manufacturing processes
- Present the outcomes of their work to an audience and discuss them competently
- Reflect on and appreciate the academic and social diversity of the international research community
- Hone their English language skills

We hope the INSPIRED networking platform will help expand our participants' education and career perspectives.

**RESOURCES**

- Tailored e-Learning content Available *via* the open-source Moodle platform
- Script (online) Available on arrival in Darmstadt
- Supplemental resources Available on request at the Course Helpdesk

**EVALUATION**

| Category/Assignment                                       | %  | Assessment  |
|---|----|---|
| Project work:<br>active participation<br>and contribution | 30 | Project coordinators: evaluation of implementation of knowledge acquired in course of the Prep-phase (e-Learning) as well as assessment of on-going work progress <ul style="list-style-type: none"><li>- Team (&amp; individual) performance</li></ul> |
| Final presentation:<br>scientific concept                 | 50 | Experts: detailed evaluation criteria defined in the script <ul style="list-style-type: none"><li>- Team performance</li></ul>  |
| Written report:<br>dossier                                | 20 | Program supervisors/coordinators: template provided in course of the Do-phase <ul style="list-style-type: none"><li>- Team performance</li></ul>  |

**GRADING**

Pass/fail-based

Number grades (1.0, very good – 5.0, fail) may be awarded if required/requested

**TRANSFER OF CREDITS**

6 CP ECTS (3 US/Canadian credit semester hours)

Awarded upon fulfillment of all assignments

**APPLICATION PROCESS**

We propose a two-tiered recruitment procedure:

**Partner institution**

Pre-selection of candidates

**TU Darmstadt**

Formula

[Online application](#)

Requisite documents

- Transcript of academic records
- Brief (one-page) motivation letter
- Copy of passport

Deadline

February 7, 2020

**HOMEPAGE**

<http://www.inspired-darmstadt.com/>

**CONTACT**

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