

Course Handbook International Project Semester Bachelor

created at 09.02.2023,09:15

International Project Semester Bachelor - mandatory courses (overview)

<u>Module name</u> <u>(EN)</u>	<u>Code</u>	SAP-P	<u>Semester</u>	Hours per semester week / Teaching method	ECTS	Module coordinator
<u>German Intensive Course</u>	IPS.GER	P231-0151	1	2V	0	<u>Dr. Julia Frisch</u>
<u>Intercultural Communication</u>	IPS.IC	P231-0141	1	1VU	0,5	<u>Dr. Julia Frisch</u>
<u>Introduction to technical project management</u>	IPS.TPM	P231-0143	1	2VF	2	<u>Prof. Dr. Frank Kneip</u>
<u>Work Experience Phase</u>	IPS.WEP	P231-0147	1	-	20	<u>Prof. Dr. Frank Kneip</u>

(4 modules)

International Project Semester Bachelor - optional courses (overview)

<u>Module name</u> <u>(EN)</u>	<u>Code</u>	SAP-P	<u>Semester</u>	Hours per semester week / Teaching method	ECTS	Module coordinator
<u>Embedded Systems and Simulink</u>	IPS.TEC2b	P231-0142	1	1V+1LU	2,5	<u>Prof. Dr. Marco Günther</u>
	IPS.TEC1	P231-0146	1	1V+1LU	2,5	

<u>Module name</u> <u>(EN)</u>	<u>Code</u>	<u>SAP-P</u>	<u>Semester</u>	Hours per semester week / Teaching method	ECTS	Module coordinator
<u>Introduction to Arduino</u>						<u>Prof. Dr. Frank Kneip</u>
<u>Optical Sensors</u>	IPS.TEC3	P231-0150	1	1V+1PA	2,5	<u>Prof. Dr. Martin Löffler-Mang</u>
<u>Sensor Systems</u>	IPS.TEC2c	P231-0145	1	2PA	2,5	<u>Prof. Dr. Martin Löffler-Mang</u>
<u>Technical Case Study</u>	IPS.TCS	P231-0149	1	2F	2,5	<u>Prof. Dr. Frank Kneip</u>

(5 modules)

International Project Semester Bachelor - mandatory courses

German Intensive Course

<p>Module name (EN): Name of module in study programme. It should be precise and clear. German Intensive Course</p>
<p>Degree programme: Study Programme with validity of corresponding study regulations containing this module. <u>International Project Semester, Bachelor, ASPO 01.10.2020</u></p>
<p>Module code: IPS.GER</p>
<p>SAP-Submodule-No.: The exam administration creates a SAP-Submodule-No for every exam type in every module. The SAP-Submodule-No is equal for the same module in different study programs. P231-0151</p>
<p>Hours per semester week / Teaching method: The count of hours per week is a combination of lecture (V for German Vorlesung), exercise (U for Übung), practice (P) oder project (PA). For example a course of the form 2V+2U has 2 hours of lecture and 2 hours of exercise per week. 2V (2 hours per week)</p>

ECTS credits:

European Credit Transfer System. Points for successful completion of a course. Each ECTS point represents a workload of 30 hours.

0

Semester: 1

Mandatory course: yes

Language of instruction:

English

Assessment:

Final test of 90 min.

[updated 22.04.2020]

Applicability / Curricular relevance:

All study programs (with year of the version of study regulations) containing the course.

IPS.GER (P231-0151) International Project Semester, Bachelor, ASPO 01.10.2020 , semester 1, mandatory course

Suitable for exchange students (learning agreement)

Recommended prerequisites (modules):

None.

Recommended as prerequisite for:**Module coordinator:**

Dr. Julia Frisch

Lecturer:

N.N.

[updated 09.02.2023]

Learning outcomes:

After successfully completing this module, the students

- may provide a basic knowledge of the German language, which allows them to communicate in general language and professional situations, verbally and in writing, as quickly as possible.
- may use all four skills (speaking, listening, reading and writing) equally.

[updated 16.04.2020]

Module content:

The German intensive course builds on little or no previous knowledge.

- Development of simple language structures that make it easier for course participants to deal with simple everyday and professional situations, such as contacting, greeting, introducing yourself and others
- Talk about the job, leisure activities and preferences
- Inquire about the condition
- General conversations (e.g. thank you, apologize, say goodbye)
- Numbers
- Time
- Informal email correspondence
- Directions
- Communication on the phone
- General speech
- Inquire and provide information
- Basic grammar structures are developed that are based on communicative needs (conjugation of regular verbs, forms of address, negation ...)
- The basic vocabulary should be expanded independently by the students.

This semester-long course is preceded by a three-week intensive course that takes place before the actual lecture period begins.

As an included module part, the intensive course is also to be regarded as compulsory; in terms of content, it functions as preparation for the weekly course during the lecture period.

The workload of the intensive phase is to be understood as additional to the specified workload of this module.

[updated 09.09.2022]

Teaching methods/Media:

Target group-specific teaching and learning materials (print, audio, video, online materials) are used during the course.

[updated 03.04.2020]

Additional information:

If German Language Level C1 is achieved prior to the start of the IPS, this course should be replaced by the course Technical Case Study (IPS.TCS)

[updated 01.07.2022]

Recommended or required reading:

- Individualized course materials tailored to the participants are provided
- Online materials via Moodle
- Niebisch/Orth-Chambah/Weers/Weißling: Erste Schritte Plus, Vorkurs, Hueber, Ismaining 2012
- Spektrum Deutsch A1 Integriertes Kurs- und Arbeitsbuch für Deutsch als Fremdsprache (Deutsch) Taschenbuch, Schubert Verlag, Leipzig 2017

[updated 03.04.2020]

Intercultural Communication

<p>Module name (EN): Name of module in study programme. It should be precise and clear. Intercultural Communication</p>
<p>Degree programme: Study Programme with validity of corresponding study regulations containing this module. <u>International Project Semester, Bachelor, ASPO 01.10.2020</u></p>
<p>Module code: IPS.IC</p>
<p>SAP-Submodule-No.: The exam administration creates a SAP-Submodule-No for every exam type in every module. The SAP-Submodule-No is equal for the same module in different study programs. P231-0141</p>
<p>Hours per semester week / Teaching method: The count of hours per week is a combination of lecture (V for German Vorlesung), exercise (U for Übung), practice (P) oder project (PA). For example a course of the form 2V+2U has 2 hours of lecture and 2 hours of exercise per week. 1VU (1 hour per week)</p>
<p>ECTS credits: European Credit Transfer System. Points for successful completion of a course. Each ECTS point represents a workload of 30 hours. 0,5</p>
<p>Semester: 1</p>
<p>Mandatory course: yes</p>
<p>Language of instruction: English</p>
<p>Assessment: Team presentation of 30 min. [updated 26.08.2022]</p>
<p>Applicability / Curricular relevance: All study programs (with year of the version of study regulations) containing the course. IPS.IC (P231-0141) <u>International Project Semester, Bachelor, ASPO 01.10.2020</u> , semester 1, mandatory course Suitable for exchange students (learning agreement)</p>

Workload:

Workload of student for successfully completing the course. Each ECTS credit represents 30 working hours. These are the combined effort of face-to-face time, post-processing the subject of the lecture, exercises and preparation for the exam.

The total workload is distributed on the semester (01.04.-30.09. during the summer term, 01.10.-31.03. during the winter term).

15 class hours (= 11.25 clock hours) over a 15-week period.

The total student study time is 15 hours (equivalent to 0.5 ECTS credits).

There are therefore 3.75 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):

None.

Recommended as prerequisite for:**Module coordinator:**

Dr. Julia Frisch

Lecturer:

N.N.

[updated 26.08.2022]

Learning outcomes:

After successfully completing this module, students will be able:

- to identify and discuss essential aspects of intercultural communication,
- to establish a connection between theoretical models and practical intercultural issues,
- to identify and analyze reasons for misunderstandings between members of different cultures,
- to organize group work in a multicultural team,
- to identify and solve conflicts a multicultural team,
- to improve their empathy towards others and their intercultural communication skills,
- to show respect for others, compromise, and tolerance,
- to further develop of confidence in themselves and trust in others.

[updated 26.08.2022]

Module content:

Discussion of fundamental questions of intercultural communication:

- Culture and cultural identity
- Dealing with prejudices and stereotypes
- Acculturation and culture shock
- Verbal and non-verbal communication
- Intercultural communication strategies
- Diversity management

- Globalization and its influences on culture and intercultural communication

Case studies and examples will be adapted to the needs of the students.

[updated 26.08.2022]

Recommended or required reading:

Hofstede, G., Hofstede, G. and Minkov, M., 2010. Cultures and Organizations: Software of the Mind. 3rd ed. McGraw-Hill.

Lewis, R., 2018. When Cultures Collide: Leading Across Cultures. 4th ed. Nicholas Brealey Publishing.

Required online reading and further literature will be given to participants during the course.

[updated 26.08.2022]

Introduction to technical project management

Module name (EN):

Name of module in study programme. It should be precise and clear.

Introduction to technical project management

Degree programme:

Study Programme with validity of corresponding study regulations containing this module.

International Project Semester, Bachelor, ASPO 01.10.2020

Module code: IPS.TPM

SAP-Submodule-No.:

The exam administration creates a SAP-Submodule-No for every exam type in every module. The SAP-Submodule-No is equal for the same module in different study programs.

P231-0143

Hours per semester week / Teaching method:

The count of hours per week is a combination of lecture (V for German Vorlesung), exercise (U for Übung), practice (P) oder project (PA). For example a course of the form 2V+2U has 2 hours of lecture and 2 hours of exercise per week.

2VF (2 hours per week)

ECTS credits:

European Credit Transfer System. Points for successful completion of a course. Each ECTS point represents a workload of 30 hours.

2

Semester: 1

Mandatory course: yes

Language of instruction:

English

Assessment:

Exam (50 %) + participation (50 %)

[updated 26.09.2022]

Applicability / Curricular relevance:

All study programs (with year of the version of study regulations) containing the course.

IPS.TPM (P231-0143) International Project Semester, Bachelor, ASPO 01.10.2020 , semester 1, mandatory course

Suitable for exchange students (learning agreement)

Workload:

Workload of student for successfully completing the course. Each ECTS credit represents 30 working hours. These are the combined effort of face-to-face time, post-processing the subject of the lecture, exercises and preparation for the exam.

The total workload is distributed on the semester (01.04.-30.09. during the summer term, 01.10.-31.03. during the winter term).

30 class hours (= 22.5 clock hours) over a 15-week period.

The total student study time is 60 hours (equivalent to 2 ECTS credits).

There are therefore 37.5 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):

None.

Recommended as prerequisite for:**Module coordinator:**

Prof. Dr. Frank Kneip

Lecturer:

N.N.

[updated 27.09.2022]

Learning outcomes:

The aim of the module is to teach the basics of operational project management and team organization.

Expertise:

The students have an introductory knowledge of the term, development, meaning, content and procedure of project management.

Competencies:

Determination and transfer of theoretical approaches and methods for solving selected project practice questions, especially in the technical area. Teaching transdisciplinary thinking.

Social skills:

The students learn about interaction, communication, motivation and moderation in teamwork.

[updated 03.04.2020]

Module content:

- Introduction to and basics of project management
- Procedural models (sequential, iterative, agile)
- Project definition
- Stakeholder management
- Key documents of project definition and expectation management
- Project planning, network planning technology
- Structure, process, capacity, appointment and cost planning
- Risk management
- Work breakdown structure
- Realistic scheduling
- Accurate estimates
- Project management
- Project phases, milestones
- Project controlling
- IT support
- MS Project
- Projektron

[updated 03.04.2020]

Teaching methods/Media:

- Lecture with integrated exercises, small group exercises, self-experience exercises
- Working on a specific project in a team
- Documentation and presentation of project progress and results
- Presentations, videos, role-playing games, documents, magazines, books, internet research

[updated 03.04.2020]

Recommended or required reading:

- DeMarco, Tom: The Deadline: A Novel About Project Management, Computer Bookshops, 1997
- Duff, Demot: Project Management – A practical guide, Management Briefs, 2011
- Heagney, Joseph: Fundamentals of Project Management, Amacom, 2016
- Maylor, Harvey: Project Management, Pearson, 2017
- N.N.: Project Management, Dorling Kindersley, 2015
- Next Level Consulting: Let your projects fly, Goldegg, 2009
- Portny, Stanley: Project Management For Dummies, Wiley, 2017
- Schelle, Ottmann, Pfeiffer: Project Manager, GPM, 2006
- Taylor, James: The Project Management Workshop, Amacom, 2001

- Verzuh, Eric: The Fast Forward MBA in Project Management, Wiley, 2015

[updated 27.09.2022]

Work Experience Phase

Module name (EN):

Name of module in study programme. It should be precise and clear.

Work Experience Phase

Degree programme:

Study Programme with validity of corresponding study regulations containing this module.

International Project Semester, Bachelor, ASPO 01.10.2020

Module code: IPS.WEP

SAP-Submodule-No.:

The exam administration creates a SAP-Submodule-No for every exam type in every module. The SAP-Submodule-No is equal for the same module in different study programs.

P231-0147

Hours per semester week / Teaching method:

The count of hours per week is a combination of lecture (V for German Vorlesung), exercise (U for Übung), practice (P) oder project (PA). For example a course of the form 2V+2U has 2 hours of lecture and 2 hours of exercise per week.

-

ECTS credits:

European Credit Transfer System. Points for successful completion of a course. Each ECTS point represents a workload of 30 hours.

20

Semester: 1

Mandatory course: yes

Language of instruction:

English

Assessment:

Project presentation and report

[updated 03.04.2020]

Applicability / Curricular relevance:

All study programs (with year of the version of study regulations) containing the course.

IPS.WEP (P231-0147) International Project Semester, Bachelor, ASPO 01.10.2020 , semester 1, mandatory course

Suitable for exchange students (learning agreement)

Workload:

Workload of student for successfully completing the course. Each ECTS credit represents 30 working hours. These are the combined effort of face-to-face time, post-processing the subject of the lecture, exercises and preparation for the exam.

The total workload is distributed on the semester (01.04.-30.09. during the summer term, 01.10.-31.03. during the winter term).

The total student study time for this course is 600 hours.

Recommended prerequisites (modules):

None.

Recommended knowledge:

IPS modules: IPS.TPM, IPS.GER, IPS.IC and IPS.TEC 1

[updated 03.04.2020]

Recommended as prerequisite for:

Module coordinator:

Prof. Dr. Frank Kneip

Lecturer:

Prof. Dr. Frank Kneip

[updated 06.04.2020]

Learning outcomes:

The students

- are able to apply their specialist knowledge acquired during their studies to specific problems and tasks in the company,
- can independently process the assigned tasks in practice,
- acquire the ability to work in a team and to communicate with the people involved in the company in a targeted manner,
- can document and present the procedure, possible solutions and the results of their work.

[updated 03.04.2020]

Module content:

Depends on the topic and the institution in which the practical phase is completed. The project topic(s) are jointly defined by the company and htw.

[updated 03.04.2020]

Recommended or required reading:

Depends on the respective subject areas dealt with in practice.

[updated 03.04.2020]

International Project Semester Bachelor - optional courses

Embedded Systems and Simulink

Module name (EN):

Name of module in study programme. It should be precise and clear.

Embedded Systems and Simulink

Degree programme:

Study Programme with validity of corresponding study regulations containing this module.

International Project Semester, Bachelor, ASPO 01.10.2020

Module code: IPS.TEC2b

SAP-Submodule-No.:

The exam administration creates a SAP-Submodule-No for every exam type in every module. The SAP-Submodule-No is equal for the same module in different study programs.

P231-0142

Hours per semester week / Teaching method:

The count of hours per week is a combination of lecture (V for German Vorlesung), exercise (U for Übung), practice (P) oder project (PA). For example a course of the form 2V+2U has 2 hours of lecture and 2 hours of exercise per week.

1V+1LU (2 hours per week)

ECTS credits:

European Credit Transfer System. Points for successful completion of a course. Each ECTS point represents a workload of 30 hours.

2,5

Semester: 1

Mandatory course: no

Language of instruction:

English

Assessment:

[still undocumented]

Applicability / Curricular relevance:

All study programs (with year of the version of study regulations) containing the course.

IPS.TEC2b (P231-0142) International Project Semester, Bachelor, ASPO 01.10.2020 , semester 1, optional course

Suitable for exchange students (learning agreement)

Workload:

Workload of student for successfully completing the course. Each ECTS credit represents 30 working hours. These are the combined effort of face-to-face time, post-processing the subject of the lecture, exercises and preparation for the exam.

The total workload is distributed on the semester (01.04.-30.09. during the summer term, 01.10.-31.03. during the winter term).

30 class hours (= 22.5 clock hours) over a 15-week period.

The total student study time is 75 hours (equivalent to 2.5 ECTS credits).

There are therefore 52.5 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):

None.

Recommended knowledge:

Knowledge in Arduino-Programming (e.g. as in IPS.TEC1)

[updated 01.07.2022]

Recommended as prerequisite for:**Module coordinator:**

Prof. Dr. Marco Günther

Lecturer: Prof. Dr. Marco Günther

[updated 02.03.2020]

Learning outcomes:

After successfully completing the course, the students master the basics of programming Matlab and Simulink. You can apply this knowledge to independently create, simulate and analyze models of technical systems such as the control of microcontrollers (e.g. Arduino). Graduates are able to check and optimize the practicality of technical systems by using simulation tools.

[updated 14.04.2020]

Module content:

Basics of Matlab / Simulink
Development of simulation models of technical systems
Analysis and interpretation of the simulation models

[updated 14.04.2020]

Recommended or required reading:

[still undocumented]

Introduction to Arduino

Module name (EN):

Name of module in study programme. It should be precise and clear.

Introduction to Arduino

Degree programme:

Study Programme with validity of corresponding study regulations containing this module.

International Project Semester, Bachelor, ASPO 01.10.2020

Module code: IPS.TEC1

SAP-Submodule-No.:

The exam administration creates a SAP-Submodule-No for every exam type in every module. The SAP-Submodule-No is equal for the same module in different study programs.

P231-0146

Hours per semester week / Teaching method:

The count of hours per week is a combination of lecture (V for German Vorlesung), exercise (U for Übung), practice (P) oder project (PA). For example a course of the form 2V+2U has 2 hours of lecture and 2 hours of exercise per week.

1V+1LU (2 hours per week)

ECTS credits:

European Credit Transfer System. Points for successful completion of a course. Each ECTS point represents a workload of 30 hours.

2,5

Semester: 1

Mandatory course: no

Language of instruction:

English

Required academic prerequisites (ASPO):

-

Assessment:

Project presentation and documentation

[*updated 24.02.2021*]

Applicability / Curricular relevance:

All study programs (with year of the version of study regulations) containing the course.

IPS.TEC1 (P231-0146) International Project Semester, Bachelor, ASPO 01.10.2020 , semester 1, optional course

Suitable for exchange students (learning agreement)

Workload:

Workload of student for successfully completing the course. Each ECTS credit represents 30 working hours. These are the combined effort of face-to-face time, post-processing the subject of the lecture, exercises and preparation for the exam.

The total workload is distributed on the semester (01.04.-30.09. during the summer term, 01.10.-31.03. during the winter term).

30 class hours (= 22.5 clock hours) over a 15-week period.

The total student study time is 75 hours (equivalent to 2.5 ECTS credits).

There are therefore 52.5 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):

None.

Recommended knowledge:

Programming skills

[*updated 24.02.2021*]

Recommended as prerequisite for:**Module coordinator:**

Prof. Dr. Frank Kneip

Lecturer:

Prof. Dr. Frank Kneip

[*updated 01.07.2022*]

Learning outcomes:

After successfully completing the course, the students

- are able to use the Arduino IDE (Integrated Development Environment) in order to program a microcontroller (Arduino)
- can depict the differences of an implementation for microcontroller based systems and offline implementation
- can design a flowchart for the microcontroller based system
- can implement code for the Arduino based on a given flowchart
- can integrate selected sensors and actuators using the microcontroller

[updated 24.02.2021]

Module content:

Basic knowledge of Arduino boards and related components (e.g. breadboard,...) is provided.

An introduction to programming a microcontroller (e.g. Arduino Uno) and the integration of sensors and actuators

in order to interact with the physical environment is provided.

The differences concerning an implementation for microcontroller based systems and an offline implementation is discussed.

The design of a flowchart for the microcontroller based system and the implementation of code for the Arduino based on a given flowchart are concerned.

[updated 24.02.2021]

Teaching methods/Media:

Project based teaching (online and/or offline)

including programming tools (e.g. Arduino IDE) and physical hardware (Arduino, sensors, actuators,...)

[updated 24.02.2021]

Additional information:

The course provides required knowledge for the IPS.TEC2a, IPS.TEC2b and IPS.TEC2a course.

[updated 24.02.2021]

Recommended or required reading:

Literature references will be provided during the lecture

[updated 24.02.2021]

Optical Sensors

Module name (EN): Name of module in study programme. It should be precise and clear. Optical Sensors
Degree programme: Study Programme with validity of corresponding study regulations containing this module. <u>International Project Semester, Bachelor, ASPO 01.10.2020</u>
Module code: IPS.TEC3
SAP-Submodule-No.: The exam administration creates a SAP-Submodule-No for every exam type in every module. The SAP-Submodule-No is equal for the same module in different study programs. P231-0150
Hours per semester week / Teaching method: The count of hours per week is a combination of lecture (V for German Vorlesung), exercise (U for Übung), practice (P) oder project (PA). For example a course of the form 2V+2U has 2 hours of lecture and 2 hours of exercise per week. 1V+1PA (2 hours per week)
ECTS credits: European Credit Transfer System. Points for successful completion of a course. Each ECTS point represents a workload of 30 hours. 2,5
Semester: 1
Mandatory course: no
Language of instruction: English
Required academic prerequisites (ASPO): Short lecture on a given element from optical sensors.
Assessment: Project presentation and documentation [updated 03.04.2020]
Applicability / Curricular relevance: All study programs (with year of the version of study regulations) containing the course. IPS.TEC3 (P231-0150) <u>International Project Semester, Bachelor, ASPO 01.10.2020</u> , semester 1, optional

course

Suitable for exchange students (learning agreement)

Workload:

Workload of student for successfully completing the course. Each ECTS credit represents 30 working hours. These are the combined effort of face-to-face time, post-processing the subject of the lecture, exercises and preparation for the exam.

The total workload is distributed on the semester (01.04.-30.09. during the summer term, 01.10.-31.03. during the winter term).

30 class hours (= 22.5 clock hours) over a 15-week period.

The total student study time is 75 hours (equivalent to 2.5 ECTS credits).

There are therefore 52.5 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):

None.

Recommended knowledge:

Experience with micro-controller (preferably with Arduino).

[updated 03.04.2020]

Recommended as prerequisite for:

Module coordinator:

Prof. Dr. Martin Löffler-Mang

Lecturer:

Prof. Dr. Martin Löffler-Mang

[updated 01.07.2022]

Learning outcomes:

After successfully completing the course, students can independently prepare a short presentation. They know the most important individual elements of optical sensor systems and how they can be combined to form more complex systems.

Furthermore, the project work enables the students to set up their own sensor system. They have mastered the application of the methods they have learned and have the basic ability to work independently. In addition, the students have acquired the skills to carry out projects in intercultural and interdisciplinary teams.

They will be able to solve minor conflicts themselves, present their own project results and document them in writing.

[updated 03.04.2020]

Module content:

Elements: LED, laser, laser diode, photodiode, CCD sensor, photomultiplier, optical fiber, coupler
Systems: light barriers, triangulation, optical mice, fiber optic sensors, spectrometers, particle measurement technology, flow measurement technology

Realized sensor applications in the past:
Measurement of the bending stiffness of arrows (spine value);
Determination of the launch speeds of bow arrows;
Air Quality Monitoring Device;
Smart Alarm System;
Laser Doppler flow measurements in channels.

[updated 23.05.2022]

Teaching methods/Media:

Introductory lecture, self-study, short presentations;
Project work in teams, consisting of:
1. Brainstorming to develop your own sensor application
2. Evaluation of the best ideas
3. Resource and cost estimation, schedule
4. Brief presentation in the plenum with assignment
5. Working phase with mentoring

[updated 03.04.2020]

Additional information:

The module is intended for students with in-depth knowledge of Arduino application.

[updated 23.05.2022]

Recommended or required reading:

Jansen: Optoelektronik
Eichler: Laser
Young: Optik, Laser, Wellenleiter
Litfin: Technische Optik
Ruck: Lasermethoden in der Strömungsmesstechnik
Löffler-Mang: Optische Sensoren
Löffler-Mang: Handbuch Bauelemente der Optik

[updated 03.04.2020]

Sensor Systems

Module name (EN):

Name of module in study programme. It should be precise and clear.

Sensor Systems

Degree programme:

Study Programme with validity of corresponding study regulations containing this module.
International Project Semester, Bachelor, ASPO 01.10.2020

Module code: IPS.TEC2c

SAP-Submodule-No.:

The exam administration creates a SAP-Submodule-No for every exam type in every module. The SAP-Submodule-No is equal for the same module in different study programs.
P231-0145

Hours per semester week / Teaching method:

The count of hours per week is a combination of lecture (V for German Vorlesung), exercise (U for Übung), practice (P) oder project (PA). For example a course of the form 2V+2U has 2 hours of lecture and 2 hours of exercise per week.
2PA (2 hours per week)

ECTS credits:

European Credit Transfer System. Points for successful completion of a course. Each ECTS point represents a workload of 30 hours.
2,5

Semester: 1

Mandatory course: no

Language of instruction:

English

Assessment:

Project presentation and documentation

[updated 03.04.2020]

Applicability / Curricular relevance:

All study programs (with year of the version of study regulations) containing the course.

IPS.TEC2c (P231-0145) International Project Semester, Bachelor, ASPO 01.10.2020 , semester 1, optional course

Suitable for exchange students (learning agreement)

Workload:

Workload of student for successfully completing the course. Each ECTS credit represents 30 working hours. These are the combined effort of face-to-face time, post-processing the subject of the lecture, exercises and preparation for the exam.

The total workload is distributed on the semester (01.04.-30.09. during the summer term, 01.10.-31.03. during the winter term).

30 class hours (= 22.5 clock hours) over a 15-week period.
The total student study time is 75 hours (equivalent to 2.5 ECTS credits).
There are therefore 52.5 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):

None.

Recommended knowledge:

TEC1: Introduction to Arduino

[updated 03.04.2020]

Recommended as prerequisite for:

Module coordinator:

Prof. Dr. Martin Löffler-Mang

Lecturer:

Prof. Dr. Martin Löffler-Mang

[updated 01.07.2022]

Learning outcomes:

After successfully completing the course, the students master the connection of standard sensors to a commercially available microcontroller (preferably Arduino). In addition, the students learned to carry out a small project. They are familiar with the brainstorming process for idea finding, can plan resources, divide up their project working hours and ultimately bill the project costs. They are able to work together in international and interdisciplinary teams, solve minor conflicts themselves, present their own project results and document them in writing.

[updated 03.04.2020]

Module content:

The sensor applications are selected by the students themselves ("Students design teaching") and implemented on their own responsibility. Typical example projects from the past were: anti-gravity, ultrasonic levitation, hand fly remote, LED hourglass, robot snake, smart parking (all 2020); Car tracking, self-righting vehicle, earthquake simulator, goal celebrations, Lissajous figures, chicken guard (2019); Sonic Vision, autofocus, ball throwing robot, ball sorting, vibration damper, Top Sonic, Dancing Steel (2018).

[updated 03.04.2020]

Teaching methods/Media:

The students go through a moderated process in teams of 3-5 people:

1. Brainstorming to develop your own sensor application
2. Evaluation of the best ideas

3. Resource and cost estimation, schedule
4. Brief presentation in the plenum with assignment
5. Working phase with mentoring

[updated 03.04.2020]

Additional information:

Ideally, the teams are multinational and interdisciplinary.

[updated 03.04.2020]

Recommended or required reading:

Hering, Martin, Storer: Physik für Ingenieure

Löffler-Mang: Optische Sensoren

Kneip: Introduction to Arduino

[updated 03.04.2020]

Technical Case Study

Module name (EN):

Name of module in study programme. It should be precise and clear.

Technical Case Study

Degree programme:

Study Programme with validity of corresponding study regulations containing this module.

International Project Semester, Bachelor, ASPO 01.10.2020

Module code: IPS.TCS

SAP-Submodule-No.:

The exam administration creates a SAP-Submodule-No for every exam type in every module. The SAP-Submodule-No is equal for the same module in different study programs.

P231-0149

Hours per semester week / Teaching method:

The count of hours per week is a combination of lecture (V for German Vorlesung), exercise (U for Übung), practice (P) oder project (PA). For example a course of the form 2V+2U has 2 hours of lecture and 2 hours of exercise per week.

2F (2 hours per week)

ECTS credits:

European Credit Transfer System. Points for successful completion of a course. Each ECTS point represents a workload of 30 hours.

2,5

Semester: 1

Mandatory course: no
Language of instruction: English
Required academic prerequisites (ASPO): German Language Level C1 The course serves as a replacement of the course German Intensive Course (IPS.GER), if German Language Level C1 is reached at the beginning of the IPS
Assessment: Report and Presentation [updated 01.07.2022]
Applicability / Curricular relevance: All study programs (with year of the version of study regulations) containing the course. IPS.TCS (P231-0149) <u>International Project Semester, Bachelor, ASPO 01.10.2020</u> , semester 1, optional course Suitable for exchange students (learning agreement)
Workload: Workload of student for successfully completing the course. Each ECTS credit represents 30 working hours. These are the combined effort of face-to-face time, post-processing the subject of the lecture, exercises and preparation for the exam. The total workload is distributed on the semester (01.04.-30.09. during the summer term, 01.10.-31.03. during the winter term). 30 class hours (= 22.5 clock hours) over a 15-week period. The total student study time is 75 hours (equivalent to 2.5 ECTS credits). There are therefore 52.5 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: <u>Prof. Dr. Frank Kneip</u>
Lecturer: <u>Prof. Dr. Marco Günther</u> <u>Prof. Dr. Frank Kneip</u> <u>Prof. Dr. Martin Löffler-Mang</u>

[updated 01.07.2022]

Learning outcomes:

Students who have successfully completed this module...

...are able to structure a given topic independently

...are able to conduct independent literature research

...are able to independently write a report on current technical and/or economic topics

...are able to communicate the essential results of the scientific seminar paper in a short presentation

[updated 01.07.2022]

Module content:

Independent induction into a given topic and conduct of a (descriptive) study

Evaluation, preparation and written documentation of the study findings according to the principles of proper scientific work in the form of a seminar paper

argumentation and defence of one's own point of view / research results in a short presentation

[updated 01.07.2022]

Teaching methods/Media:

Supervision of independent student research

Independently written report, presentation and defence of the results

[updated 01.07.2022]

Recommended or required reading:

Literature will be provided depending on case study

[updated 01.07.2022]