

Project Instructions

TFYA99

Design, processing, and test of a sensor system

Start date: 2021-08-30

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Version nr	Date	Description	Signed by
1.0	2021-05-26	First version, adapted from former TFYA92, version 3.0	D. Puglisi

Customer	Donatella Puglisi
Project leader	Student
Project decisions	Customer
Final approval	Examiner
Project time	Fall semester 2021. Project ends in January 2022
Project goal, short	The project goal is to design, process and test a sensor system prototype based on an innovative sensor technology of interest for the customer. Details can be found in the Syllabus.
Reports	LIPS-based documents: • Group contract • Requirement specification including a simple system layout • Project plan including ○ List of activities and time schedule ○ Design of the sensor system for monitoring, e.g., gases, temperature, humidity, CO₂ level ○ Design of gas testing experiments and gas testing schedule ○ Planning of laboratory tests and field tests ○ Data evaluation plan • Weekly agenda and meeting minutes of the project's progress (please note: this task does not include the status progress of the entrepreneurship part) • Weekly time report • Understanding of lab instructions, acceptance protocol • The LIPS course material should be carefully read (especially useful for beginners of CDIO courses) • Documentation of project results in a technical report including ○ Test procedures (design, fabrication, characterization, testing, analysis) ○ Measurement results ○ Data evaluation and discussion ○ Literature study and adequate reference list (to be included in the technical report) ○ Other own studies/training needed for fulfilling the project ○ Conclusions, future perspectives, recommendations for further investigation (to be included in the technical report) ○ 1-page summary (to be included in the technical report) ○ Reflection document

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	- Post study including evaluation of results and time consumption Quality check is recommended for all documents. Materials other than the LIPS-based documents: - Poster (accepted sizes: A3, A2, A1), short video or wiki page - Oral presentation about the project work and results incl. demonstration of the prototype
Partners	Customer: Donatella Puglisi Examiner/Course responsible: Donatella Puglisi Supervisor: Guillem Domènech Advisor: Jens Eriksson Project group: 4 to 7 students (possibility of sub-groups)
Project goals in technical detail	To be discussed with the customer and supervisor, and approved by the examiner
Deliverables, Decision Points, Assignments	At the indicated dates, the following documents should be delivered to customer/examiner and supervisor: Week 37 DP0, September 13: - Outline/Draft of idea for the project (one A4 page) - Group contract Week 38 DP1, September 20: - Requirement specifications including system layout (approved by the examiner) Assignment 1, September 22 (approved by the supervisor) Week 39 Assignment 2, September 29 (approved by the supervisor) Week 40 DP2, October 4: - Project plan (approved by the examiner) - Design specification (approved by the examiner) - Understanding of lab instructions, acceptance protocol (to supervisor, only) Assignment 3, October 6 (approved by the supervisor) Week 50 DP3, December 13: - Technical report (first version)

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	• Poster layout, video or wiki page proposal for customer approval Week 51 DP4, December 20 (13-17): • Oral presentation showing that the requirement specifications are fulfilled, and the project goals are achieved. This task includes a prototype demonstration. • Poster or video or wiki page presentation Week 2 DP5, ultimate deadline January 7, 2022 • Final version of the technical report • Post study of result performance and time consumption Please note: The deadline for the submission of the final version of the technical report is specified for approval and registration of the course within the Fall semester. The time reports for each person/group and activity & status reports should be uploaded on Lisam, in the Collaborative workspace, every week. Each group keeps track of the progress work through weekly meeting minutes that should be written at each group meeting and uploaded on Lisam.
Project participants	The project group should preferably have, or will acquire: • Understanding of gas sensors and sensor systems • Understanding of parameters influencing sensor response • Some experience in measurement technology • Some knowledge in signal processing and data evaluation Source: lectures, reading materials, own literature study Sources: lectures, reading materials, literature study, previous knowledge, lab supervision, lab experience, skills training. The project group should have at least the following roles: • Project leader • Document responsible • Testing responsible • Data evaluation responsible • Time report responsible • Quality check responsible The workload assigned to each role has to be equally distributed among the group members.
Contacts:	Donatella Puglisi (customer/examiner), donatella.puglisi@liu.se

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	Guillem Domènech (supervisor), guillem.domenech@liu.se Jens Eriksson (advisor), jens.eriksson@liu.se
Main project decisions	Will be taken at decision points (DPs) and group presentations
Responsible for consumables	Donatella Puglisi
Project costs (time)	This is the time budget within the project course (9 ECTS): • Ca. 25 hours of introductory lectures and other teaching sessions • Ca. 215 hours/student on the project work incl. all activities (preparation, experimental activities, reading, literature search, self-study, writing, meetings, workshops) for a total budget of 240 hours/student, corresponding to 9 ECTS. Within this time budget, each group can use 25 hours of supervision from Guillem Domènech, for help in lab and support on practical needs. Open dialogue and constructive feedback among all project's participants are encouraged throughout the course.
Expenses	No expenses can be charged to the examiner/course responsible without permission.
Financing source	Division of Sensor and Actuator Systems (SAS), Department of Physics, Chemistry and Biology (IFM), Linköping University

The students are encouraged to take initiative but monitoring the feasibility of their choices using critical thinking, openly discuss with their supervisor, customer/examiner and ask for feedback.

The course is carried out in such a way most of the work is done under responsibility of the students. The students will work in an industry-like environment. This means that they will receive support, advices and guidance, but not specific instructions, and they are responsible for their own decisions.

Experience, knowledge, competence and skills of both women and men are equally highlighted and developed.