[Project system]

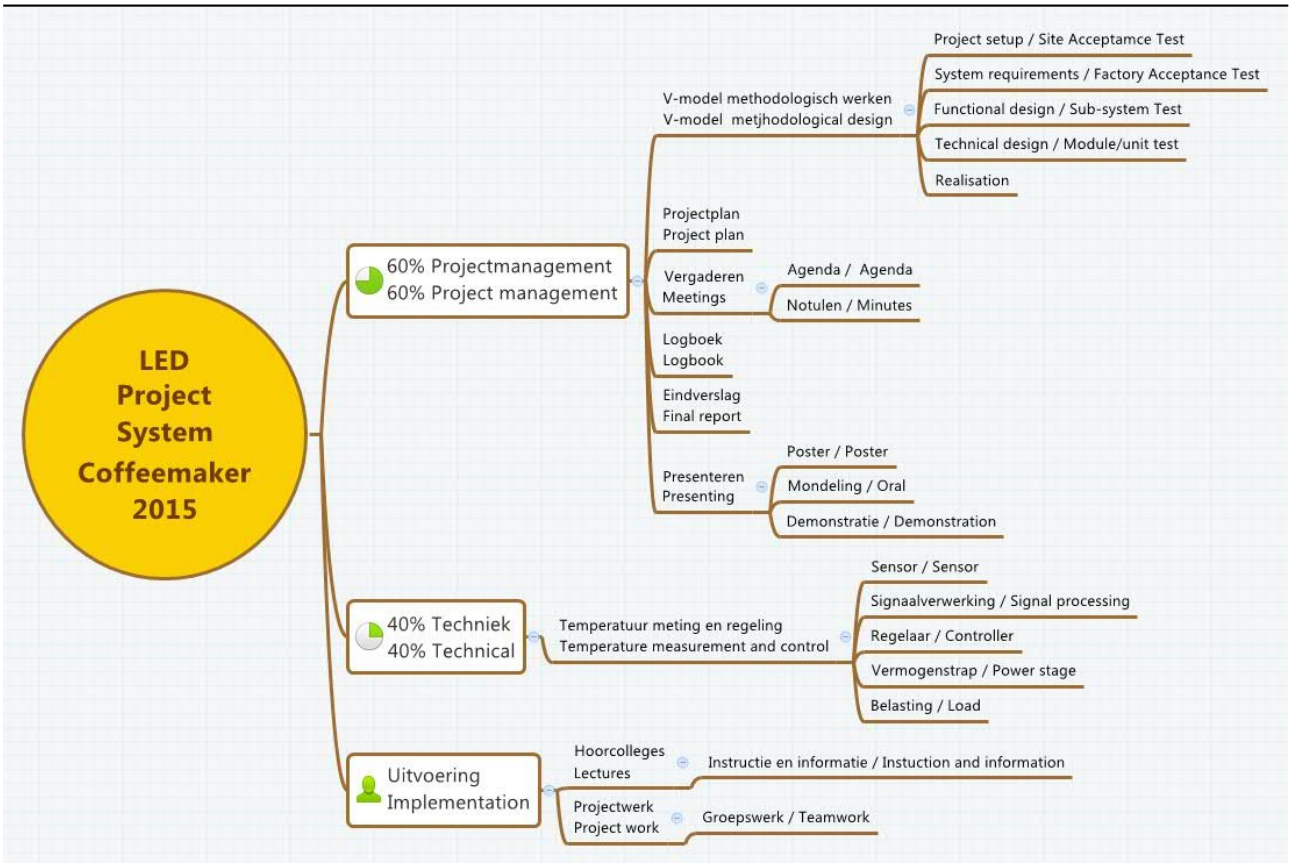
School of Life Science, Engineering & Design

Course title	Project system	Examination code:	T.LED.43316
Phase of study	Propedeuse	EC	7
Lecturer in charge :	Christiaen Slot / Evert Berendsen	Document Version:	2015 spring

Course description / Moduul omschrijving
The aim of this module is to learn, in a group, more about project management and basic technical calculations, simulations and measurement. This module is done as group work. The group acts as a real engineering company. The group or engineering company assignment is **”Saxion EEE is looking for an engineering company who can modify a simple coffee maker machine into an advanced coffee-maker-machine. The temperature of the drinking coffee should be adjustable.”**

Course objectives / Doelstellingen
Students will be able to:
- Analyse an existing coffee-maker-machine
- Calculate and build temperature control
- Work for a customer
- Work in a structured way following the V-model
- Experience teamwork
- Organise meetings
- Feel time pressure
- Report technical information
- Present all project results in the oral way, via a poster and with a demonstration

Course topics / Onderwerpen
- 40% Technical Temperature-measurements-control:
- 60% Project management:



Prerequisites / Voorkenniseisen
Mathematics and Physics on college level

Literature / Literatuur

Title	Author	Publisher	ISBN
Course book coffee maker	J.W.Bollen		
Project management	Roel Grit	Noordhof uitgevers	NL 978-90-01-79093-6 ENG 978-90-01-79092-9

Educational materials required / Benodigde onderwijsmiddelen

1. Hardware took box
2. Internet access
3. Simulation program
4. Complete office 2010 program

Competences / competenties

The competences are the eight competences of a Bachelor of Engineering.

	Competence	Level (*)	
1	Analyse	1	- Translation of user requirements into a methodological approach - Analysis for the Design Requirements - Analysis for the Functional Design and motivation of choices - Analysis for the Technical Design and motivation of choices
2	Design/Engineer	1	Technical execution of the project
3	Realise	1	Building of the system (usable for a demonstration)
4	Control	1	Verification and Validation of the system (Testing, part of the report)
5	Manage	1	- Management during the execution of the project (following the methodological approach in the PP) - Modification of the PP according to changing situations
6	Advise	1	- Recommendations for future development (part of the report)
7	Research	1	- Research and analysis for the Design Requirements - Research for the Functional Design and motivation of choices - Research for the Technical Design and motivation of choices
8	Professionalise	1	- Communication - Collaboration - Attitude - Presentation

(*) Level

1 Nature of the assignment: basic, structured, applying a standard methodology
Nature of the context: known, basic, mono discipline, at the university
Amount of independency: limited, controlled guidance

Assessment / Toetsing

A group report of the whole process of innovating the coffee-maker is made by each group. Also a final presentation will be done by the whole group, each member participating. At the end a demonstration of the modified coffee-maker is done. It should work correctly!

Project Assessment

Assessment (*)	Analyse	erDesign/Engine	Realise	Control	Manage	Advise	Research	Professionalise	Who	Result	Weighing
Project Plan	x				x				Group	mark	10%
Technical Functioning	x	x	x				x		Individual	mark	10%
Professional Functioning					x			x	Individual	mark	20%
Result				x					Group	mark	20%
Reports	x	x				x	x	x	Group	mark	30%
Presentations								x	Individual	mark	10%

(*) See for a more detailed description the assessment form of the project.

Beside the project all students get classes in designing a Printed Circuit Board PCB in the hardware lab. PCB design will be explained and every students should make his/her own PCB.

The totally mark of this module consist of 2 items:

Project mark 1 10
PCB mark PASS / FAIL

In total this module gives you 7 ECTS when passed

Lesson schedule / lessen planning
Students have instruction colleges, will work as a group in the lab, and organise meetings

Wk:	Method	Time	topics	Literature
3.1	- instruction ======== - project work		- Introduction to the assignment / user requirements / client contact / Acceptance test plan / V-model (in general) / time activities / explain logbook / deliverables / review ========== - Making the groups / making companies / logo design / different roles / starting logbook making the company	Project management Roel Grit
3.2	- instruction ======== -project work		- Wheatstone bridge theory / temperature sensor ========== - Wheatstone simulation (individual) / show format for a measurement report / make measurement report - Discuss simulation results per group / class	
3.3	- instruction ======== -project work		- V model / Project setup / System requirement (general) / Functional design (general) Technical design (general) / Realization (general) ========== - Analyze original machine / describe working of the machine in 3 domains: electrical chemical and thermally. Describe components draw electrical circuit (Multisim) and give electric circuit in detail.	Multisim
3.4.	- instruction ======== - project work **========** **-meeting 1**		- Blok diagram temperature control, system requirements (in detail) ========== - Temperature measurements 12 Volt - Temperature measurements 15 Volt - Processing measurement data in EXCEL ========== - **agenda 1** - (original machine, functions components, electrical circuit, project plan, logbook pp)	
3.5	- instruction ======== - project work		- Concepts, morphological diagram, choosing concepts, functional requirements (in detail) ========== - Brainstorm functional design / Who is the user / What is the new temperature range / What concept is chosen in connection to knowledge (complexity) / What functionality	

Wk:	Method	Time	topics	Literature
	======== **-meeting 2**		will the new machine have. ========== **Agenda 2 / minutes meeting 1** (Analyse temperature data / Conclusions / New temperature range / Functional design)	
3.6	- instruction ======== - project work		- Pilot concept presentation per group by chairman. ========== - Implementing feedback / Work out new ideas / Start documentation / start presentation	
3.7.	- instruction ======== - project work		- Reporting in detail / poster presentation in detail / Data on cost calculations ========== - Finalise documentation - **Hand in minutes 2**	
3.8.	- project work		- Hand in analyse report - Work on ppt for functional design presentation	
3.9				
3.10	- presentation		**presentation functional design GO/ NO GO**	
4.1	- project work **-meeting 3**		- Technical design / technical block diagram – calculating and selecting essential components – 3D and 2D mechanical design – schematics and PCB design – Pseudo code – module / unit test plan - ========== - **Agenda 3** - Progress	
4.2	- project work		- Technical design / technical block diagram – calculating and selecting essential components – 3D and 2D mechanical design – schematics and PCB design – Pseudo code – module / unit test plan	
4.3	- project work ======== **-meeting 4**		- Realisation / mechanical – making components and module assembly / Electrical-Electronic – making PCBs and module assembly / Software – module coding ========== **Agenda 4 / minutes meeting 3**	
4.4	- project work		- Realisation / mechanical – making components and module assembly / Electrical-Electronic – making PCBs and	

Wk:	Method	Time	topics	Literature
			module assembly / Software – module coding **Module/unit test – Sub-system test – Factory Acceptance test**	
4.5	- project work		- Measurement	
4.6	- project work ======== -**meeting 5**		- Demonstration of working machine – Site acceptance test - Finalize report / Work on poster / Work on PPT / Finalize logbook ========== **Agenda 5 / minutes meeting 4** - Last meeting: what to do to finalise everything	
4.7	- project work		- Hand in final report	
4.8.	- presentation		**Final presentation - Inclusive demonstration** **Poster presentation** **Side acceptance test** - **THE END**	