



Term project

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Conditions for successful completion of the subject „Design methodology“

- Minimum 75% attendance at the seminars.
- Active and successful presentation of the results of the semester project.
- Passing the final test.



List of lectures

no. of lecture	Date	Time	Room	Lecture topic
1.	24.02.2020	8:50	KTS	Introduction lecture
2.	02.03.2020	8:50	KTS	Methods of creative work
3.	09.03.2020	8:50	LDP	Evaluation of variation solution and selection the best solution
4.	16.02.2020	8:50	KTS	Product lifecycle
5.	23.03.2020	8:50	LDP	Team work
6.	30.03.2020	8:50	KTS	Manufacturability and technical preparation of production
7.	06.04.2020	8:50	KTS	Standardized building elements of machines
8.	13.04.2020	8:50	KTS	Drives - Easter
9.	20.04.2020	8:50	KTS	Basic rules for creating drawing documentation
10.	27.04.2020	8:50	KTS	Dimensioning principles
11.	04.05.2020	8:50	KTS	Determination of tolerances
12.	11.05.2020	8:50	KTS	Industrial legal protection
13.	18.05.2020	8:50	KTS	Systems for support activities for the CAD engineer
14.	25.05.2020	8:50	KTS	Moder materials

Recommended literature:

Myrup Andreasen, Mogens, Thorp Hansen, Claus, Cash, Philip, Conceptual Design, ISBN 978-3-319-19839-2

Stark, John Product Lifecycle Management, ISBN 978-3-319-17440-2

Munier, Nolberto, Risk Management for Engineering Projects, ISBN 978-3-319-05251-9



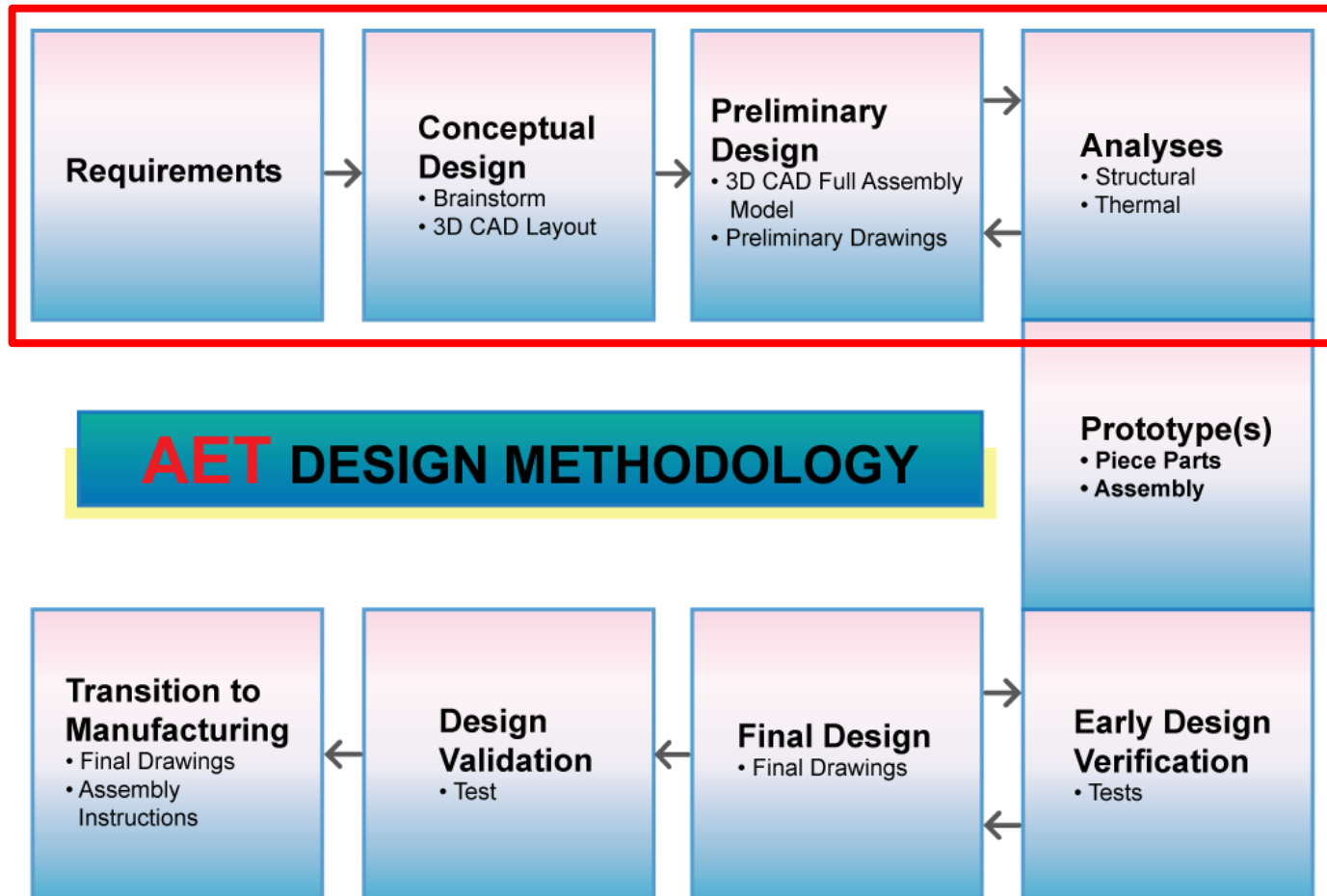
List of practices

no. of seminar	Date	Time	Room	Lecture topic
1.	27.02.2020	10:40	LDP	Definition of semestral work
2.	05.03.2020	10:40	LDP	Time for work
3.	12.03.2020	10:40	LDP	Selection of the optimal solution
4.	19.03.2020	10:40	LDP	Time for work
5.	26.03.2020	10:40	LDP	Time for work
6.	02.04.2020	10:40	LDP	Control Day 1.
7.	09.04.2020	10:40	LDP	Time for work
8.	16.04.2020	10:40	LDP	Time for work
9.	23.04.2020	10:40	LDP	Time for work
10.	30.04.2020	10:40	LDP	Time for work
11.	07.05.2020	10:40	LDP	Time for work
12.	14.05.2020	10:40	LDP	Control Day 2.
13.	21.05.2020	10:40	LDP	Time for work
14.	28.05.2020	10:40	LDP	Final presentation



Introduction to the problem of design methodology

Design Methodology – block diagram



Introduction

The purpose of the term project is to acquire work methodologies of a CAD engineer in the process of product development with an **emphasis on teamwork**. The aim is to practice the initial stages of product development.

Students will be divided into teams of **about three people**, and these teams will **compete** for the contract to produce the desired product. Each team will choose one representative, who will direct it. The work of the team will be evaluated continuously. **The evaluation** will be done by the client, as well as the other teams, based on set rules (see below).



Comments to the assignment:

The first step is to invent several possible solutions to the problem (at least 3 different feasible variants). The second step is to select the optimal variant (evaluated based on technical and economic indicators). The third step is to design the system in the form of **3D model** and to create **assembly drawing** and **manufacturing drawings** for selected parts, which must meet all requirements. 3D model must include all components including drives.

Standardized parts should be used for the construction to the maximum extent possible. Do not create the geometry of these parts, but use the available geometry databases e.g. <http://www.traceparts.com/>. Use a format that provides the volume representation of the geometry. Drives and cabling will not be part of the project. The project will result in 2D and 3D documentation for the prototype and **PowerPoint presentation** of the results for the final presentation and description of the results.



Milestones system

The term project should meet the following milestones:

Week 1 : project assignment

*Project assignment, process explanation,
evaluation system introduction*

Week 3 : presentation of variants – *selection of the optimal
solution for detailed elaboration*


Week 6 : control day - *3D documentation check*

Week 12 : control day - *2D documentation check*

Week 14 : final presentation of the solutions, results evaluation



General timetable

General time table - Design Methodology 2020							 TECHNICAL UNIVERSITY OF LIBEREC Faculty of Mechanical Engineering						General time table	
Milestones														
Number of seminar	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
Datum	27.02.2020	05.03.2020	12.03.2020	19.03.2020	26.03.2020	02.04.2020	09.04.2020	16.04.2020	23.04.2020	30.04.2020	07.05.2020	14.05.2020	21.05.2020	28.05.2020
Terms of Reference														
Proposals for solutions														
Selection of the optimal solution														
Creating 3D Documentation														
Creating 2D Documentation														
Control day 1														
Control day 2														
Preparation of final presentation														
Final presentations														

General timetable – defines timetable and milestones of team work on the term project. Red-filled cells are fixed milestones. They serve for progress fulfilment evaluation, eventually planning remedial actions.



Individual (group) version of timetable

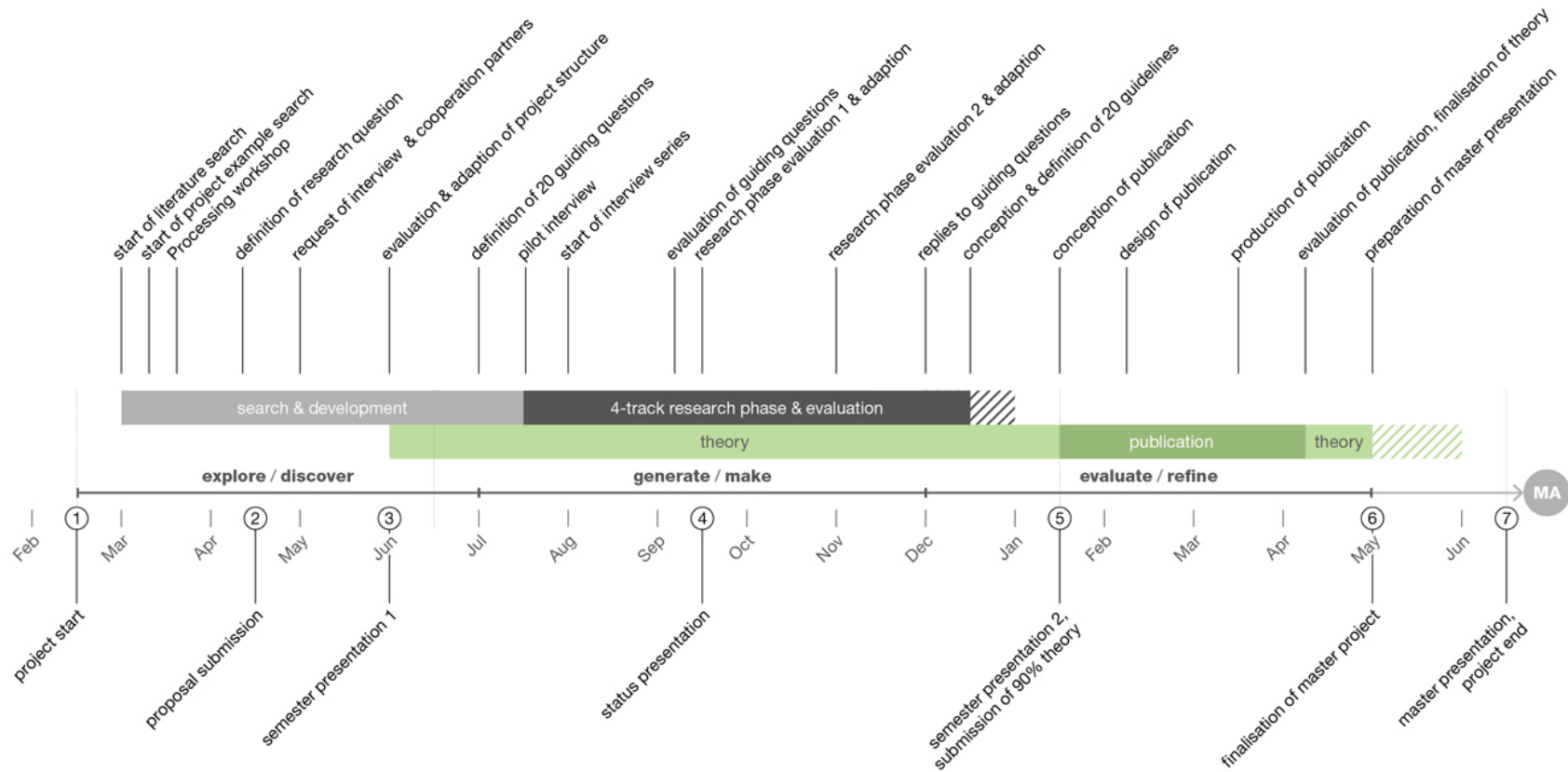
continuity

task completed	Group time table - Design Methodology 2016				Example		TECHNICAL UNIVERSITY OF LIBEREC Faculty of Mechanical Engineering	
ongoing								
unfulfilled								
name of researcher / Datum of deadline for the task	13.2.2016	15.3.2016	22.3.2016	29.3.2016	5.4.2016	12.4.2016	19.4.2016	26.4.2016
Simon Kovar	3 proposals			Check of drawings				
Jan Valtera		Creation of 3D assembly model						
Petr Zabka			Creation of 2D documents					
Josef Skrivanek	Support for all persons	Support for all persons	Support for all persons	Support for all persons				

Timetable is used to control the work and responsibilities of each team member. Color coding defines the status in which the task is. Also, link between tasks should be obvious



Milestones – example 1



Milestones – example 2

	FALL 2010										BREAK			WINTER 2011										
Week	1	2	3	4	5	6	7	8	9	10	1	2	3	1	2	3	4	5	6	7	8	9	10	
Development																								
Meet group and advisor	■	■																						
Needs analysis		■																						
Problem formulation			■	■																				
Build a testable system					■	■	■	■	■															
Observe existing system						■	■	■	■															
Brainstorm & analyze design alternatives									■	■														
Finalize design									■	■														
Order necessary parts										■														
Complete progress report										■														
Implementation																								
Write & test algorithm in MATLAB											■	■	■											
Adapt algorithm to microprocessor														■	■	■	■							
Construct system														■	■	■	■							
Test system & algorithm																■	■	■	■					
Make appropriate modifications																	■	■	■	■				
Finalize prototype																						■	■	
Complete final report																							■	■



Evaluation system

Project assesment					NOTES	
Group	Criteria	Weight factor	Lecturer	Student	Mark	Mark definition
2	Team work	3	4	0	4	Excellent
	Milestones fullfilment	3	4	0	3	Very Good
	Feasibility of the final design	2	4	4	2	Good
	Presentation of the project	2	4	4	1	Poor
	Student attendance	2	4	0	0	Unsatisfactory
	Cost-effectiveness of the final design	2	4	4		
	Novelty of the final design	1	4	4	Student attendance assesment:	
	Number of considered designs	1	4	0	Number of team members present at the tutorials / number of the team members enrolled.	
	Technical documentation quality	1	4	0	e.g. 1: full team attendance, 0: none	
	Safety aspects consideration	1	4	0		
Total Mark	TM			100	TM=S criteria * weight factor * mark (lecturer + student)	

