

School of Mathematics, Computer Science and Engineering Department of Mechanical Engineering and Aeronautics

Year 2017/18

ME2104

Mechanical Analysis and Design

Coach Assessment Report

Team Number: Group

Team Name: Group

Coach: Name

BACKGROUND

- This report is to be kept by the group coach, used at meetings throughout the year and returned at the end of the project.
- Its intention is to ensure that the coach and team are aware of the academic requirements of the project and follow best practice throughout.
- The contents will form a part of the assessment and it is therefore important to be properly maintained and up to date at all times.
- The report is reviewed on the weekly basis by the Sypervisor

PROJECT SCHEDULE

The schedule for the ME2104 project is shown below with major learning and project outcomes highlighted. This should be maintained by the team coach and utilised for keeping teams on track during the project. It is also used to provide guidance to teams for adequate preparation for the milestone project reviews and post revision implementation of changes. Further details of weekly objectives will be provided during lectures. The progress of each student will be assessed each week by the Coach of the team using the forms provided in this document.

Key for schedule:

LECTURES
Team/individual work - tutorials
Design Reviews - Presentations
CAD lectures (ME2110)
DAE - Design Analysis Exercise

Term 1

Week	Date	Design AG21 - Mondays 11,00-12,50	Analysis ELG01 - Fridays 10,00-11,50
1	02-Oct	Introduction to Engineering design	DAE1: Thermo/Eluid - Lecture/CW
•	06-Oct	Team forming, Project start	
2	09-Oct	Team work and Objectives tree	DAE1: Thermo/Eluid - Lecture/CW
2	13-Oct	Assignment, Start of the project	
2	16-Oct	Objectives Tree, Functional Model	DAE1: Thormo/Eluid Locturo/CW
5	20-Oct	Project work - Team meeting	
4	23-Oct	Performance Specification, QFD	DAE1: Thormo/Eluid Looturo/CN/
4	27-Oct	Project work - Team meeting	DAE I. Meimo/Fluid - Lecture/CW
5	30-Oct	1 st Project Review - Vision &	1 st Project Review - Vision &
5	03-Nov	Concepts	Concepts
	06-Nov	Concepts, Morph Chart	DAE1:Thormo/Eluida Assosment
	10-Nov	Project work - Team meeting	DAL 1. Melmo/Tidids - Assesment
6	13-Nov	Concept Evaluation and Decision	DAE2: Machanical Analysis Lastura
0	17-Nov	Project work - Team meeting	
7	20-Nov	Concepts - revision	DAE2: Machanical Analysis Lastura
1	24-Nov	Project work - Team meeting	DAEZ. Mechanical Analysis-Lecture
0	27-Nov	Embodiment Design	DAE2: Machanical Analysia Lastura
0	01-Dec	Project work - Team meeting	DAEZ. Mechanical Analysis-Lecture
0	04-Dec	2 nd Dreiget Deview Embedyment	and Droiget Deview, Embedyment
3	08-Dec		
10	11-Dec	Feedback understanding	DAE2: Mochanical Analysis Tut
10	15-Dec	Project work - Team meeting	DAEZ. Mechanical Analysis-Tul,

Term 2

Wook	Data	Design	Analysis
Week	Date	ELG01 - Mondays 14,00-15,50	Geary - Thursdays 15,00-16,30
11	29-Jan	Detailed design	DAE3: Dynamics Lecture
11	02-Feb	Project work - Embodyment design	DAE3: Vehicle Dynamics - Assignment
12	05-Feb	Detailed design - revision	DAE3: Dynamics - Lecture
12	09-Feb	Project work - Detailed design	DAES. Dynamics - Lecture
13	12-Feb	3rd Project Poview - Detailed Design	DAE3: Dynamics - Lecture
13	16-Feb	Sid Floject Review - Detailed Design	DAES. Dynamics - Lecture
1/	19-Feb	Detailed design - revision	DAES: Dynamics - project work
14	23-Feb	Project work - Detailed design	DALS. Dynamics - project work
15	26-Feb	Manufacturing - briefing and rules	DAE3: Vahiela Dynamics - Assessment
15	02-Mar	Project - Purchasing/Manufacture	
RI W	05-Mar	Reflective learning week - Manufacturing	Reflective learning week
	09-Mar	Work on the Main Project	Work on the Main Project
16	12-Mar	Manufacturing - Issues	DAE4: Elastic/Plastic Lecture
10	16-Mar	Project work - Manufacturing	DAE4: Deformations&FEM - assignment
17	19-Mar	Manufacturing - Refining prototypes	DAE4: Materials - Lecture
17	23-Mar	Project work - Manufacturing	
18	26-Mar	Testing of Prototypes (EOM)	DAE4: FEM & deformations - Lecture
10	30-Mar		Team meeting - project work DAE4
19	02-Apr	Project work - Report preparation	DAE4: Deformations&EEM - project work
19	06-Apr		
20	09-Apr	Final Dracontation	DAE4: Deformations & FEM Assessment
20	13-Apr		DAE4. Delothations&FEIM - Assesment

Manufacturing Schedule

Date	Week no	Ti	me	AE1 & CLG01
Mon 19/02/2018	Week 4	16:00	18:00	Supervised Manufact.
Thu 22/02/2018	(5 hrs)	15:00	18:00	Manufacturing
Mon 26/02/2018	Week 5	16:00	18:00	Supervised Manufact.
Thu 01/03/2018	(5 hrs)	15:00	18:00	Manufacturing
Mon 05/03/2018	Reading	09:00	12:00	Supervised Manufact.
Tue 06/03/2018	week	09:00	17:00	Manufacturing
Wed 07/03/2018		09:00	12:00	Manufacturing
Thu 08/03/2018	(18 hours)	09:00	12:00	Manufacturing
Mon 12/03/2018	Week 6	16:00	18:00	Supervised Manufact.
Thu 15/03/2018	(5 hrs)	15:00	18:00	Manufacturing
Mon 19/03/2018	Week 7	16:00	18:00	Supervised Manufact.
Thu 22/03/2018	(5 hrs)	15:00	18:00	Manufacturing
Thu 26/02/2019	Wook 8	12.00	17:00	FOM Testing
1110 20/03/2018	VV EEK O	15.00	17.00	Sports Centre
Man 00/04/2018	Week 10	14.00	19.00	"Dragon's Den"
10101109/04/2018	WEEK IU	14:00	18:00	200 Aldersgate

MARKING SCHEME

The marking scheme for ME2104 is based on the following breakdown of group project work, coursework DAE assessment and final exam. The group coach is asked to assess the group on all aspects of the design project, and to assign individual indicators for the attendance and performed tasks for each student from the group during each team meeting. The elements of each of the assessments are detailed in this document further below.

Assessment Scheme		
Group Design Proj	ect	48
Project work		15
	Research + Concepts	5
	Embodyment	5
	Detailed Design	5
Written Report	Written style and analytical skills	5
Oral Presentation	Communication, response to questions	5
FOM	Prototype performance in User Testing	15
Personal logbook	Personal development document	8
Analysis Coursewo	ork	12
DAE 1	Thermo/Fluids	3
DAE 2	Mechanical Elements	3
DAE 3	Dynamics	3
DAE 4	Deformations & FEM	3
Exam	Mechanics Thermo/Fluids Materials/Deformations/FEM Vehicle Dynamics Principles of Engineering Design	40
Overal mark		100

MANAGEMENT STRUCTURE



THE ROLE OF THE SUPERVISOR

Two Supervisors are appointed for the Tennis Ball Server Project. Each Supervisor is responsible for a number of groups and coaches for these groups. The role of the supervisor is to advise the coach on the coaching style and to support the coach in all aspects of the project. In particular the supervisor should advise coaches and students on technical issues related to the project and ensure that groups have all required elements for performing the project in all phases of the project.

The supervisor should also assist Coach to resolve any issues that may arise in the group and inform the Module leader on any arising issues. Together with the module leader, the Supervisor will organise all phases of the project including design, manufacture and testing.

THE ROLE OF THE COACH

Each group is assigned with the Coach. The role of the coach is to help the group to learn the Engineering Design Process and to perform tasks in the Tennis Ball Server Project. The Coach is not part of the group and is not supposed to perform any tasks of the group which include technical and managerial tasks. However, the Coach is expected to be constantly in contact with group and to assist the group to progress. In case of any issues in the group, the coach is asked to immediately inform the Supervisor and Module leader about issues. The group coach is asked to keep the record of attendance and performed tasks through the table for each term.

The group coach is expected to attend all Group Design assessments, proactively participate in assessing and give appropriate feedback to their group within the same week of the assessment. The coach is also asked to upload the marks on Moodle and to keep the online assessment sheet up to date at all times.

ORGANISATION OF GROUPS

Each group is expected to have group leader, scribe and team members for different aspects of the project. Each person in the group should at some stage of the project experience the role of the group leader and scribe. The groups operate on the 'flat organisational structure' i.e. all members of the group are equal and are required to perform their expected roles. The group leader has a managerial role and is assisted by scribe who apart of assisting the group leader is also expected to do technical aspects of the project. The group members are expected to equally distribute tasks and to help each other to perform these tasks well. The group is expected to work in a friendly, creative and productive atmosphere. Groups are expected to meet at least twice a week for the whole duration of the project and to have clear tasks for each member of the group defined in these meetings and clearly monitored and managed

WEEKLY GROUP MEETINGS

The Coach must attend the first project kick-off meeting with their group and all following weekly meetings wherever possible. Coach must maintain a clear line of communication with students and ensure that the appropriate input and milestone feedback are provided.

Coach should encourage planning and organisation of team meetings whenever possible as this will keep things focussed and reduce time commitment – for example, request specific information or a detailed agenda to be distributed in advance.

Items to address during review meetings include: attendance, project management, progress against plan, and project direction. The team leader is responsible for setting up an appropriate schedule of meetings and with the scribe managing communication channels in a format agreed with the coach and other team members.

STUDENT ATTENDANCE AT WEEKLY MEETINGS MUST BE RECORDED AS THIS IS AN IMPORTANT PART OF ASSESSING ENGAGEMENT!

PROJECT MANAGEMENT

Project management is a key aspect of group design projects. Teams are expected to make use of formal mechanisms such as meeting minutes, action lists, plans etc. to ensure that they co-ordinate themselves effectively and interact in a professional way. The coach is expected to support and facilitate this process. Teams are required to rotate the role of team leader, and coaches should encourage this person to take responsibility for the organising and running of meetings at that time. Teams must demonstrate that they are using appropriate management techniques to run and control their project. All coaches should assess this and flag up any issues.

MONITORING GROUP PROGRESS

In order to improve visibility of the students work, the following is recommended from the coach:

- Check individual and group weekly reports.
- Have access to your groups online work folders (Box, etc) and check documents regularly.
- Check your groups online 'Conceptboard' regularly pay special attention to which team member are active (i.e. making comments uploading text, images, analysis results, question, etc).

These measures combined with weekly meeting should allow you to flag up any issues within the team. This is likely to include both technical and personal problems, particularly in the run-up to project reviews; Supervisors have several years of experience with this project and can help with most problems, but more serious issues should be raised immediately with the Module leader.

PROJECT REVIEWS, ASSESMENT AND FEEDBACK

Feedback on the group work is provided continually by the coach during the weekly project review meetings. At each milestone the appropriate deliverables will be assessed and rated by the coach using this document. There must be written feedback from the coach and tutors at each stage. In the week following the milestone, the coach should go through the feedback with the team and address any points that require further action. The review and evaluation of milestones is part of the 'Project Work' marks which account for 15% of the marks for ME2104.

PROJECT MILESTONES

There are five major milestones during the project. Teams will be assessed against each milestone and coaches should provide detailed feedback on each of these.

- 1st Project Review Vision & Concepts
- 2nd Project Review Embodiment Design
- 3rd Project Review Detailed Design
- Prototype testing
- Final Presentation and Final Written Report

The following pages contain forms to record the group performance in each of these milestone reviews.

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DAE 3	Dynamics	3
DAE 4	Deformations & FEM	3
Exam	Mechanics Thermo/Fluids Materials/Deformations/FEM Vehicle Dynamics Principles of Engineering Design	40
Overal mark		100

1st Project Review – Vision & Concepts (Out of 5 marks)

	Indicative mark						
Evaluation criteria		40- 50	50-60	60- 70	70- 80	>80	
Completeness of working agreement, branding/logo, WBS, calendar, Gantt chart, group Conceptboard workspace (10%)							
Standard of FoM analysis, market research, design constraints, affinity diagram (10%)							
Standard of objective tree, weightings, preliminary requirements list (10%)							
Standard of 'black box' and full functional models (10%)							
Standard of brain storming and morphological chart (10%)							
Standard of concept generation (20%)							
Standard of QFD including; competitor analysis, engineering characteristics, discussion of objectives vs. functions (10%)							
Standard of projectile motion and pressure analysis (20%)							

COACHES COMMENTS:

2nd Project Review - Embodiment

Evaluation criteria (% mark weighting)		Indicative mark						
		40- 50	50- 60	60- 70	70- 80	>80		
Clarity of project introduction and summary (10%)								
Completeness and standard of corrections/updates from Phase 1 (10%)								
Standard of detailed requirements list, plans for next phase (10%)								
Standard of concept analysis and decision matrix (20%)								
Standard of technical vs. economic analysis (5%)								
Quality of the selected concepts (5%)								
Quality of 3D CAD Embodiment Model (20)								
Quality of Selection of gears and pulleys (15%)								
Completeness of updated Gantt chart, calendar and WBS/plan (5%)								

COACHES COMMENTS:

3rd Project Review – Detailed Design

	Indicative mark					
Evaluation criteria (% mark weighting)	<40	40- 50	50- 60	60- 70	70- 80	>80
Clarity of project introduction and summary (10%)						
Quality of design, component selection and material/manufacturing process selection (30%)						
Quality of CAD and technical drawings (30%)						
Organisation and content for online group design spaces Box, Conceptboard, etc. (20%)						

COACHES COMMENTS:

Final Presentation

	Indicative mark					
Evaluation criteria (% mark weighting)	<40	40- 50	50- 60	60- 70	70- 80	>80
Clarity of project introduction and summary (10%)						
Quality of manufacturing drawings and CAD models (10%)						
Standard of sales and marketing strategy and business model (10%)						
Standard of cost analysis and breakeven curve (10%)						
Discussion of prototype testing and FoM performance (10%)						
Quality of product poster (20%)						
Quality of user manual (10%)						
Standard of content for online group design spaces Box, Conceptboard, etc. (20%)						

COACHES COMMENTS:

Final written report

	Indicative mark					
Evaluation criteria (% mark weighting)	<40	40- 50	50- 60	60- 70	70- 80	>80
Clarity of project introduction and summary (10%)						
Quality of manufacturing drawings and CAD models (10%)						
Standard of sales and marketing strategy and business model (10%)						
Standard of cost analysis and breakeven curve (10%)						
Discussion of prototype testing and FOM performance (10%)						
Quality of product poster (20%)						
Quality of user manual (10%)						
Standard of content for online group design spaces Box, Conceptboard, etc. (20%)						

COACHES COMMENTS:

FIGURE OF MERIT SCORE FOR PROTOTYPE TESTING

$$FoM = Z.\left[10.(50 - C) + 100.\left(1.8 - \frac{(d_C + d_D)}{2}\right) + 100.T + 20.(25 - W)\right] + 20.A + 20.E + 200.DI + 30.OI$$

FoM parameter:	Value	
Height multiplier	Ζ	
Cost (£)	C	
Distance from corner (m)	dc	
Distance from corner (iii)	d_D	
No. of landing zone hits	Т	
Total mass (kg)	W	
Aesthetic appeal (0-4)	Α	
Ease of use (0-4)	Ε	
Design innovation (1-4)	DI	
Quality of instructions (0-4)	OI	
Calculated FoM	-	

COACHES COMMENTS:

COACHES NOTES

Use the following pages to keep notes during the course of the project.

Term 1 – Week 1

Term 1 – Week 2

Term 1 – Week 3

Term 1 – Week 5

Term 1 – Reading Week

Term 1 – Week 6

Term 1 – Week 7

Term 1 – Week 8

Term 1 – Week 9

Term 1 – Week 10

Term 2 – Week 1

Term 2 – Week 2

Term 2 – Week 3

 $Term \ 2-Week \ 4$

Term 2 – Reading Week

Term 2 – Week 6

Term 2 – Week 7

Term 2 – Week 8

Term 2 – Week 9

Term 2 – Week 10

RECORD OF ATTENDANCE AND INDIVIDUAL WORK DONE (based on the Weekly report) GROUP 1

GROUP 1													-								TE	RM 1	1			
C		Meeting during Lecture Session													Additional Meeting											
Surname	Iname	1	2	3	4	5	R	6	7	8	9	10	1	2	3	4	5	R	6	7	8	9	10			

The student will be given 0 if not attending the meeting

The student will be given 1 if attending the meeting but not showing sufficient realisation of tasks

The student will be given 2 if attending the meeting and shown the agreed tasks to be finished.

RECORD OF ATTENDANCE

GROUP 1

TERM 2

Surname Name	Nama	Meeting during Lecture Session													Additional Meeting											
	Iname	1	2	3	4	5	R	6	7	8	9	10	1	2	3	4	5	R	6	7	8	9	10			

The student will be given 0 if not attending the meeting

The student will be given 1 if attending the meeting but not showing sufficient realisation of tasks

The student will be given 2 if attending the meeting and shown the agreed tasks to be finished.