COURSE INFORMATION

Department/ Faculty:	Mechanical Precision Engineering, Malaysia-Japan International Institute of Technology	**Page:**	1 of 4
		Student learning Times (Hours) :	120
		Revision :	D
Course code:	SMJP 3303/3192	**Academic Session/Semester:**	20192020 / 2
Course name:	**Intergrated Design Project/Capstone Design**	**Pre/co requisite (course name and code, if applicable):**	Static, Solid Mechanic, Fludis mechanic, Thermodynamic
Credit hours:	3		

Course synopsis	This is an advanced course on modelling, design, integration and best practices for use of machine elements such as bearings, springs, gears, cams and mechanisms. Modelling and analysis of these elements is based upon extensive application of physics, mathematics and core mechanical engineering principles (solid mechanics, fluid mechanics, manufacturing, estimation, computer simulation, etc.). These principles are reinforced via a substantial design project where students need to model, design, and conduct engineering analysis to come out the best final design prior to fabrication process of the real prototype. Student assessment is based on the student's ability to design, synthesize, and model the best solution from given complex engineering problem. In addition, not to forget the ability to manage the project which includes team working, budget, and project period are also being assessed.			
Course coordinator (if applicable)	Dr. Ahmad Muhsin bin Ithnin			
Course lecturer(s)	**Name**	**Office**	**Contact no.**	**E-mail**
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Mapping of the Course Learning Outcomes (CLO) to the Programme Learning Outcomes (PLO), Teaching & Learning (T&L) methods and Assessment methods:

No.	CLO	PLO EAC / UTM	Weight (%)	Taxo. & generic skills*	T&L methods	WP	WK	EA	Assessment methods
CO1	Able to apply knowledge of mathematics, sciences, engineering fundamentals and engineering specialization to the solution of complex engineering problems.	1 / KW	15	CTPS1	Group Project	2	√		Pr,R
CO2	Able to conduct investigation into complex problems using research based knowledge, research methods, and synthesis of information to provide valid conclusions.	2 / THPA	20	CTPS3	Group Project	3	√		Pr,R

Prepared by: Name: Dr. Ahmad Muhsin Bin Ithnin Signature: Date: 12-11-2019	Certified by: Name: AP.Dr. Sheikh Ahmad Zaki bin Shaikh Salim Signature: Date:

No.	CLO	PLO EAC / UTM	Weight (%)	Taxo. & generic skills*	T&L methods	WP	WK	EA	Assessment methods
CO3	Able to design the solution of the complex engineering problem with appropriate engineering analysis, materials selection, considering trade-offs in performance, cost and manufacturability	3 THDS	25	C6 CTPS5	Group Project	7	√		Pr,R
CO4	Able to work effectively in a team as a member or leader in order to accomplish the project	10 TW	10	TS1-TS4	Group Project				PR
CO5	Properly document experiments with clear problem statement, procedures, project management and costing	9, 12 CS, ES	30	CS6 GC6	Group Project			3	Pr, R
Refer *Taxonomies of Learning and **UTM's Graduate Attributes, where applicable for measurement of outcomes achievement ***T – Test; Q – Quiz; ASG –Assignment; PR – Project; Pr – Presentation; F – Final Exam; R-Report; PR-Peer Review etc.									

Details on Innovative T&L practices:

No.	Type	Implementation
1.	Lecture	Give lecture on the concept with example of problems and solutions
2	Tutorial and Discussion	Give tutorial and request the students to submit at the end of the class, discussions are allowed.
3	Group Project	Form the students in group. Group project is given and students are required to discuss in the group, come out with solutions/outputs and submit a report.

Transferable skills (generic skills learned in course of study which can be useful and utilised in other settings):

Skill in analysing information, Thinking Critically, solving Problems, disseminating application to engineering

Weekly Schedule:

Week 1	Project briefing, rules and regulations
Week 2	Team briefing on organizing the project
Week 3-13	**Weekly project meeting with supervisors**
Week 14	Demonstration, presentation and report submission

Student learning time (SLT) details

Distribution of student Learning Time (SLT) Course content outline	Guided Learning (Face to Face) Lecture Practical/Tutorial/Studio Student-Centered learning					Teaching and Learning Activities			TOTAL SLT
						Guided Learning Non-Face to Face Revision	Independent Learning Non-Face to face Self-Directed learning Assessment Preparation Revision		
CLO	**L**	**T**	**P**	**O**					
CO1	5		5				6		16
CO2	6		6				10		22
CO3	10		10			4	4		28
CO4							11		11
CO5						20	14		34
Total SLT	**21**		**21**			**24**	**45**		**111**

ASSESSMENT DETAILS

Continuous Assessment		CLO	PLO EAC/UTM						Taxo	Total SLT
Components	Percentage		1/KW	2/THPA	3/THDS	9/CS	10/TW	12/ES	Gen.	
Peer Review	10	4					10		TS1-4	1
Presentation	5	1	5						CTPS1	1
	5	2		5					CTPS3	1
	10	3			10				CTPS5	1
	20	5				15		5	CS6 GC6	1
Final Assessment										
Final Report	10	1	10						CTPS1	1
	15	2		15					CTPS3	1
	15	3			15				CTPS5	1
	10	5				5		5	CS1, GC6	1
Total Marks	100 %		15	20	25	20	10	10		
	Total SLT Continuous Assessment									**9**
	Grand Total SLT									**120**

Special requirement to deliver the course (e.g: software, nursery, computer lab, simulation room):

Learning resources:

Text book (if applicable)

H.F. Hoffman, The Engineering Capstone Course: Fundamentals for Students and Instructors, Springer Cham Heidelberg New York Dordrecht London, ISBN 978-3-319-05896-2, 2014.

F. Bloetscher and D. Meeroff, Practical Concepts for Capstone Design Engineering, J. Ross Publishing, Inc., USA, ISBN 978-1-60427-114-0, 2015.

R.G. Budynass and J.K. Nisbett, Shigley's Mechanical Engineering Design, 10th edition, McGraw-Hill Series in Mechanical Engineering, ISBN 978-0073398204, 2015.

C.W. de Silva, Mechatronics: An Integrated Approach, CRC Press, Taylor & Francis Group, Florida, ISBN 978-0-20350278-5, 2005.

Mikell P. Groover, Fundamentals of Modern Manufacturing 3rd edition, Asia, Wiley, ISBN 0471742929, Call Number TS183 G765 2002. Zainal Abidin Ahmad, Proses

Academic honesty and plagiarism:

Cheating is not only dishonest, but also self-destructive. Some of the principles of academic honesty that are especially important in this courses are:

- Plagiarism is a very serious violation. All the writing in your documentation and/or reports must be your own work. You may not copy sentences or paragraphs from books, web pages, other students, or any other source. If you quote or use anything written by anyone else, you must indicate very clearly that it is a quotation ***and*** you must provide a full citation.
- All the programming code that you claim credit for (implicitly or explicitly) must be your own creation. If you use software written by anyone else, you must disclose this very clearly both in your code and in all accompanying documentation and reports.
- Tables and figures of programming results that show how your programs run, must be genuine and not misleading. It may happen that some of your code or algorithms do not work correctly. In this case you must mention and explain this situation in documentation and reports.
- If you work in a team on any assignment or project, and there is a case of academic dishonesty, then all members of the team will be assumed to be equally responsible and will be subject to the same penalties. If you work in a team, it is your responsibility to make sure that your partners are as honest as you are, and that they are well-informed about what is permissible.

Other additional information (Course policy, any specific instruction etc.):

Disclaimer: