Engine Design

Course Introduction

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Course Details

1	**Course Code and Name**	BMA3623 Engine Design		
2	**Semester and Year Taught**	Semester 5/6 Year 3		
3	**Program Level/Category**	Degree/Mechanical Design		
4	**Unit**	3 Credits		
5	**Prerequisite**	BMM1543 Strength of Materials		
6	**Teaching Methods**	Lecture:	3 units	(3 hours X 14 weeks)
		Tutorial:	0 unit	(0 hour X 14 weeks)
		Laboratory:	0 unit	(0 hours X 14 weeks)

Course Synopsis

- This course extends the knowledge on strength of materials towards engine components design. The design of essential machine elements are investigated. The internal combustion engines kinematics and dynamics are analysed. The design of engine components and engine balancing are examined.

Course Outcomes

- CO1: Demonstrate mechanical design process and the design of essential machine elements.
- CO2: Analyse internal combustion engine kinematics and dynamics.
- CO3: Design internal combustion engine components.
- CO4: Develop numerical tools for engine components design and analyses.

Assessments

Assessment	CO1	CO2	CO3	CO4	Distribution
Midterm Exam	√	√			30%
Quizzes/ Assignments	√	√	√	√	15%
Project			√	√	15%
Final Exam		√	√		40%
Total					100%

Quizzes/Assignments

- Will be conducted at the end of each topic.
- Check KALAM everyday.
- Individually assessed.
- Must complete before the dateline.
- Think hard and look for answers in the books (listed in the references list).

Tips

- Don’t ask ‘*Google-able*’ questions.
- However, don’t rely too much on Prof. G.
  - Do ask if you cannot understand
- Please read and prepare before the lecture.
- Learn to understand and study for exams.
- Aim to CREATE not COPY.

Project

- Is a group project.
- List of names and appointed leader **week 2.**
- Assessment via report and presentation.
- Choose members with the best chemistry.

References

1. R.L. Norton, 2013. Kinematics and Dynamics of Machinery, McGraw-Hill Education; 2nd edition in SI units.
2. R. G. Budynas, J. K. Nisbett, 2015. Shigley's Mechanical Engineering Design, Tenth Edition in SI, McGraw-Hill.
3. MAHLE International GmbH, 2016. Cylinder components: Properties, applications, materials (ATZ/MTZ-Fachbuch), Springer Vieweg; 2nd ed. 2016 edition.
4. Heywood, J. B. (1988). Internal Combustion Engine Fundamentals, McGraw-Hill International.
5. Taylor, C. F. (1985). The Internal Combustion Engine in Theory and Practice: Combustion, Fuels, Materials, Design, The M.I.T. Press.

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