

**MODULE DESCRIPTOR**

Guidelines for completion are available<sup>1</sup> as are Red Guides on developing a new module and Delivering a module<sup>2</sup>.

<b>1. Module Code</b>	MSDE 323	<b>2. Title of new module</b>	Design of Machine Elements
<b>3. Subject Division</b> <i>where relevant</i>	Engineering		
<b>4. Module level</b> <i>4, 5, 6 etc.</i>	5	<b>5. Module Tutor</b>	Dong Young Jang
<b>6. Credit points</b> <i>10, 20,30 etc</i>	10	<b>7. Year long or semester based</b>	Semester
<b>8. Type of module</b> <i>eg standard, dissertation, work-based study</i> <i>A full list of module types is provided in the guidelines<sup>1</sup>.</i>	Standard		
<b>9. Location(s) of delivery</b> <i>For collaborative delivery, please state name(s) of institution(s) with country and start month(s) for each. A full list is available on the SITS help file in eLP</i>	SeoulTech, Korea, September		

**MODULE DESCRIPTIONS**

**10. Synopsis of module** (SITS Module Descriptor Sequence 0001)  
*A brief overview of aims, learning outcomes, learning, teaching, assessment, & feedback methods, and rationale*

This is the first course that presents mechanical engineering students with design challenges rather than set-piece problems. To understand dynamics, statics, physics of operations, and structural details of machine elements is necessary to build machinery that works safely, reliably, and well by satisfying constraints of material strength and fatigue life. Assessment is through quiz, a term project, assignments and other miscellaneous class works.

**11. Indicative reading list or other learning resources** (SITS 0002)

**1. Recommendations for purchase by students**

N/A

**2. Books**

1) Shigley's Mechanical Engineering Design, Richard G. Budynas and J. Keit

<sup>1</sup> <http://northumbria.ac.uk/sd/central/ar/qualitysupport/approval/forms/>

<sup>2</sup> <http://northumbria.ac.uk/sd/central/library/marcel/redguides/browse/?view=Standard>

<p>h Nisbett, 8th Edition, 2008</p> <p>2) Mechanical Engineering Design, Shigley &amp; Mischke, McGrawHill, 1989</p> <p>3) Machine Design An Integrated Approach, Robert Norton, Prentice Hall, 2008</p> <p><b>3. Journal Articles</b></p> <p>N/A</p> <p><b>4. Journals and Newspaper Titles</b></p> <p>N/A</p> <p><b>5. Databases and Websites</b></p> <p>N/A</p> <p><b>6. Any Other Resources</b></p> <p>N/A</p>
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**12. Outline syllabus (SITS 0003)**

*A list of module contents*

**Basic parts on materials, load and stress analysis, deflection and stiffness**

Material mechanics and basic engineering data for element design

**Failure prevention from static/Dynamic loadings**

Static and dynamic factor of safety against static and fatigue failures

**Machine Element Design**

Shaft design. Fasteners design. Springs and permanent joints. Selection of bearings. Lubrication. Gear system  
(gear systems design will be covered in the Intermediate Design)

**13. Aims of module (SITS 0004)**

*Broad statement of educational intent and overall purpose of module*

This module aims to lead student are with knowledge of mathematics and basic engineering mechanics into the design and selection of basic mechanical engineering design elements, and to afford the student exposure to the goals of the design engineer with respect to the synthesis of these elements into a cohesive module.

**14. Learning outcomes (SITS 0005)**

*State what expected to know and/or be able to do at end of module*

The student will be able to :

1. Select engineering materials for cost effective performance. (A3)
2. Utilize the principles of design and techniques to develop products and related manufacturing processes. (A5)
3. Plan and conduct an investigative or development project subject to technical, time and commercial constraints. (C1)
4. Design a component, system or process and demonstrate its feasibility through testing or simulation (C5)

**15. Pre-requisite(s)** (SITS 0006)

*Any module which must already have been taken at a lower level, or any stipulated level of prior knowledge required*

Mechanics of Materials-MSDE 218  
Computer Aided Design-MSDE 220

**16. Co-requisite(s)** (SITS 0007)

*Modules at this level which must be taken with this module*

Computer Aided Engineering-MSDE 327

**17. Distance learning delivery** (SITS 0008)

*If the module is offered (wholly or in part) by distance learning, please give detail of delivery arrangements and the specific resources required e.g. materials, communication facilities, hardware, software etc.*

None

**18. Learning and teaching strategy** (SITS Module Descriptor Sequence 0009)

This module will be delivered using a combination of lectures, set work and presentation, and independent individual learning.

**19. Assessment and feedback strategy** (SITS Module Descriptor Sequence 0010)

*Please provide details of assessment (formative and summative) and indicate how students will be provided with feedback on their performance. (A breakdown of summative tasks is also provided in section 23.)*

a. Summative assessment and rationale for tasks

Short quizzes worth 20% are set to provide students with the opportunity to gauge their progress and reinforce their understanding of the design of machine elements.

A final term project report worth 60% provides students with a range of design process considering design principle, mechanics of materials, and material science.

Assignments and miscellaneous class work worth 20% are designed to evaluate students' ability to understand course materials.

Term project will be given as a group project and students have to organize design groups for their final project.

b. Formative assessment – detail of process and rationale

Scheme of the formative assessments on the reports, presentations and assignments of each design group will be provided to the students when students get assignments and projects for their evaluations. Verbal feedback during the presentations will be given to each design projects and each design group must consider the feedbacks for their final version of reports.

c. Indication of how students will get feedback and how this will support their learning

Feedback will be in the form of verbal (formative) during the presentations and summative feedback will be via written comments on the pre-reports before formal

reports.

**20. Implications for Choice** (SITS Module Descriptor Sequence 0011)

*Possible follow-on modules, or exclusions, or modules which require this one as a pre-requisite*

Pre-requisite for MSDE 422 Capstone Design I and MSDE 423 Capstone Design II

**21. Notional Student Workload (NSW) for each mode of delivery**

(SITS Module Descriptor Sequence 0012)

*The total hours should be 100 for a 10 credit module, 200 for a 20 credit module etc.*

*Note that time taken to undertake assessments should be included in any category where appropriate. Time in formal examinations or tests should be shown separately.*

<b>Mode of delivery (eg FT, PT, DL)</b> <i>Please complete a separate column where the distribution of notional student workload differs for a particular delivery pattern</i>	<b>FT</b>			
<b>Lectures</b>	30			
<b>Seminars</b>				
<b>Tutorials</b>	15			
<b>Laboratory/studio/practical work</b>	10			
<b>Directed learning</b>	20			
<b>Independent learning</b>	20			
<b>Placement/work experience learning/fieldwork</b>				
<b>Duration of examination(s)/test(s)</b>				
<b>Other (please give details of other hours indicated)</b> :Formal Presentation	5			
<b>Total workload</b> <i>200 hours for 20 credit module, 100 for 10 credit module etc.)</i>	100			

**SUMMATIVE ASSESSMENT**

**22. Form of Reassessment**

*Either synoptic or non-synoptic reassessment*

	<b>Y/N</b>
<b>Synoptic reassessment</b> <i>One form of reassessment that tests all module learning outcomes</i>	100 Y
<b>Non-synoptic reassessment</b> <i>Where module referred overall, individual failed components of assessment are reassessed</i>	

**23. Component Assessment**

*To be completed for each component of assessment*

<b>Sequence</b> <i>001, 002 etc.</i>	<b>Assessment type</b> <i>indicate ONE of the following types: AO Attendance only CP Clinical Placement CW Coursework EXAM PRE Presentation</i>	<b>Brief description of assessment</b> <i>e.g. type/length of exam, type/word limit of coursework</i>	<b>Weighting</b> <i>% or Pass/Fail (for grade only components) Note: % weightings should add</i>	<b>Final assessment</b> <b>Y/N</b>

			<i>up to 100% for module overall</i>	
001	CW	Quizzes	20	
002	PRE	Final presentation report	60	Y
003	CW and PRE	Assignments and miscellaneous class work	20	

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24. **Date of SLT Approval**

25. **Subject code**  
 This ensures that the correct area receives appropriate funding and should be completed in consultation with the School Registrar or nominee. Advice can also be sought from Financial Planning.

26. **Module mark scheme assigned<sup>3</sup>**

<b>27.</b>	<b>Component mark scheme assigned<sup>3</sup></b>	
	<ul style="list-style-type: none"> <li>• <i>For each component listed in section 23 indicate the mark scheme attached.</i></li> <li>• <b><i>Note that for synoptic mark schemes (ie MOD1, MOD3 and M50SY only) an additional component should be entered for the reassessment with sequence 900 and assessment type SYN.</i></b></li> </ul>	
	001	

<b>28.</b>	<b>Date of entry onto SITS</b>	
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<sup>3</sup>A list of marking schemes (module and component) can be accessed from <http://northumbria.ac.uk/sd/central/ar/qualitysupport/approval/forms/>