



•MLO1. Apply knowledge and understanding of scientific principles and methodology related to solving w

**Northumbria University Programme Framework for Northumbria Awards - Module Specification**

<b>Faculty</b>	Engineering and Environment	<b>Department</b>	BEng (Hons) Mechanical Engineering (Manufacturing Systems and Design)		<b>Subject</b>		<b>Module Tutor</b>	Dong Young JANG	
<b>Module Title</b>	Intermediate Engineering Design & Product Management						<b>Module Code</b>	MSDE 324	
<b>Module Type*</b> (see key below)	Choose an item.								
<b>Module size credits</b>	<b>Level 3:</b>		<b>Level 4:</b>		<b>Level 5:</b>	10	<b>Level 6:</b>		<b>Level 7:</b>
<b>Home programme/s for which the module is designed</b>			BEng (Hons) Mechanical Engineering (Manufacturing Systems and Design)				<b>Code/s</b>		
<b>Additional Programme/s other than that/those for which the module for specifically designed</b>							<b>Code/s</b>		
<b>Delivery Pattern (Please tick)</b>		<b>Semester based</b> (please specify)	Sem 1 <input type="checkbox"/> Sem 2 <input checked="" type="checkbox"/>		<b>Year Long</b>		<input type="checkbox"/>	<b>Full-time</b>	<input checked="" type="checkbox"/>
								<b>Part-time</b>	<input type="checkbox"/>
								<b>Distance Learning</b>	<input type="checkbox"/>
<b>Location(s) of delivery:</b> If delivered at EPWO partners please give partner name and location									

**\*KEY:**

APL	Accreditation for prior learning	P/F	Pass/fail module	PLIN	Placement - Industrial
CORE	PNVQ core skills module	P/F_DS	Pass/fail dissertation module	PRAC	Practical
DISS	Dissertation	P/F_PJ	Pass/fail project module	PROJ	Project
FLDW	Fieldwork	P/F_PL	Pass/fail placement module	STAN	Standard module
INDS	Independent study	PLAY	Placement – academic study abroad FT	WKBS	Work base study
MAFOUN	MA foundation modules - ASS	PLCL	Placement – Clinical	WORK	Workshop



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**Module Overview (Max 250 words per section)** (This section is aimed at providing a prospective or current student with a brief overview of the module in answer to the specific questions and will form an element of the module handbook)

<b>What will I learn on this module?</b> (SRS 0001) Please give a brief indication of the content of the module including the main topic / subject areas studied	
In this module, students will learn about design processes including concept generation, product design phase, and product generation. After that design evaluation phase will be introduced such as product evaluation, cost analysis, and how to apply patents. Topics included are general methodology how to design engineering systems, the teamwork, and communication skills that will serve students in their capstone design classes and engineering careers.	
<b>How will I learn on this module?</b> (SRS 0002) Please provide a brief overview the learning and teaching approaches the student can expect to experience.	
This module will be delivered by regular lectures, and during the lectures, students will have opportunities to carry out prototyping operation and demonstrate robust design. Through open ended projects, they have a chance to prove their learning and design methodology in the design of practical mechanical systems.	
<b>How will I be supported academically on this module?</b> (SRS 0003) Please provide a brief overview of the academic support available to students, including any support that may be accessed outside formal scheduled teaching.	
During your active learning sessions, academic support will be available to facilitate your exploration of the problem-solving activities. Formative feedback will be provided by the module team, including answering student queries and providing guidance concerning the module such as assessments and your academic progress. The electronic learning platform (eLP) provides a comprehensive resource for integrated learning incorporating learning materials and reading lists that will facilitate directed and self-directed learning. Contact with academic tutors and your peers outside formal teaching hours is encouraged through dedicated 'office hours', discussion boards and messaging systems within the eLP. Professional support staff provide the first point of contact for a range of queries, including, for example, those concerning assessment submission, late submission/extensions, and other administrative issues.	
<b>What will I be expected to read on this module?</b> (SRS 0004) All modules at Northumbria include a range of reading materials that students are expected to engage with. The reading list for this module can be found at: <a href="http://readinglists.northumbria.ac.uk">http://readinglists.northumbria.ac.uk</a> (Reading List service online guide for academic staff, this contains contact details for the Reading List team – <a href="http://library.northumbria.ac.uk/readinglists">http://library.northumbria.ac.uk/readinglists</a> )	
<b>Northumbria University Library Reading List Service (please confirm the following)</b>	<b>Please give date added</b>
A draft reading list has been created and on the university Library Reading List Service	<a href="#">Click here to enter a date.</a>
Reading material has been acquired and digitised (following approval)	<a href="#">Click here to enter a date.</a>
Reading list has been published to students (for module delivery)	<a href="#">Click here to enter a date.</a>

**NB – for PFNA alignment process only, module authors should complete either the University Library e-Reading List, or Appendix 1.**



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**Module Learning Outcomes (MLOs)** (*Max of five in total\**, for standard 20-credit modules)

*\*this can increase to a maximum of 10, for modules with more than 20 credits*

<p><b><u>What will I be expected to achieve?</u></b> (SRS 0005)</p> <ul style="list-style-type: none"> <li>• C5: Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health &amp; safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.</li> <li>• C7: Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts.</li> <li>• C14: Discuss the role of quality management systems and continuous improvement in the context of complex problems.</li> <li>• C16: Function effectively as an individual, and as a member or leader of a team.</li> </ul>	<p><b><u>How will I be assessed?</u></b> (SRS 0006) <i>Please give details of all formative and summative assessment process indicating which MLOs will be addressed and how feedback will be provided.</i></p> <p><b>Formative Assessment</b> Academic staff on the module will assess you in a formative manner to help build your confidence and highlight any misunderstandings you may have of the theoretical and professional concepts presented in the module. Your formative feedback will be given to you either verbally by academic staff on the module during formally scheduled teaching sessions. Your formative feedback aims to help you learn and prepare for the submission of your summative assessment.</p> <p><b>Summative Assessment</b> Academic staff on the module will assess you in a summative manner by three pieces of assessment:</p> <p>Component 1. Assignments and short presentation to evaluate students' understanding on the principles of design processes (C5 &amp; C7).</p> <p>Component 2, midterm formal presentation with report to assess students' abilities to demonstrate design principles and communication skills (C5 &amp; C7 &amp; C14 &amp; C16).</p>	<p><b><u>Programme (Level) Learning Outcomes that this module contributes to:</u></b> <i>[Please insert PLO number as listed on the programme specification]</i></p> <p><b>Knowledge &amp; Understanding:</b></p> <ul style="list-style-type: none"> <li>• KU1. Apply advanced knowledge of the scientific and mathematical foundations of engineering to solve problems.</li> <li>• KU3. Identify and utilise advanced methodologies to create solutions to a variety of engineering problems.</li> <li>• KU4. Define and investigate unfamiliar problems and constraints that occur in engineering design with the aid of appropriate tools.</li> </ul> <p><b>Intellectual / Professional skills &amp; abilities:</b></p> <ul style="list-style-type: none"> <li>• IPSA5. Demonstrate the ability to solve open ended design problems and communicate the designs to a third party.</li> </ul> <p><b>Personal Values Attributes</b> (Global / Cultural awareness, Ethics, Curiosity) (PVA):</p> <ul style="list-style-type: none"> <li>• PVA2. Apply creativity in the development of solutions to standard engineering problems.</li> <li>• PVA3. Include sustainable engineering techniques when applied to engineering systems and products.</li> </ul>
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	<p>Component 3, An open ended design, is used to evaluate your ability to apply creativity and knowledge of design to analyse and design of undefined mechanical systems (C5 &amp; C7 &amp; C14 &amp; C16)</p>	
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<p><b>Pre-requisite(s)</b> (SRS 0007) Any module which must already have been taken, or any stipulated level of prior knowledge required in order to study this module, (co-requisite core models need not be listed)</p>	<p>MSDE 216 Energy Studies MSDE 218 Mechanics of Materials MSDE 225 Creative Design</p>
<p><b>Co-requisite(s)</b> (SRS 0008) Modules at this level which must be taken with this module</p>	<p>N/A</p>

**Module abstract (SRS 0009)**

**Please provide a brief a brief abstract of the module (150 words max).** This section acts as the ‘shop window’ for the module, therefore it needs to engage and inspire the student. This is the first thing that the student will read about this module, so it must immediately grab their attention. The main aim is to encourage the student to read on, however the summary should be written in such a way that if the student reads nothing else this section will convey all key messages and benefits that the module will offer. Start by explaining the module title where necessary. Then highlight any selling points relating to the four pillars: Research-Rich Learning; Technology Enhanced Learning; Assessment and Feedback; Employability and Entrepreneurship. Examples may include student satisfaction rates, learning environment, state-of-the-art facilities etc. Finally indicate benefits of the module such as the key skills that the students will gain for future employment and career paths that are open to them.

This module provides the student with abilities to work in teams and to communicate effectively as design engineers. Topics included are general methodology how to design engineering systems, the teamwork, and communication skills that will serve students in their capstone design classes and engineering careers. Assessment is through projects and assignments. Mid-term and final reports and presentation as well as short reports and presentation during class hours are considered for the assessment.

**Programme Framework for Northumbria Awards Research Rich Learning Design Pillar (SRS 0090)**

**Embedding Research Rich Learning into the curriculum:** Indicate how students will be actively engaged in research rich learning in this module through: research/enquiry based learning, research tutored learning, research led learning and/or research oriented learning, providing a brief overview of how this / these will feature within the delivery of the module (250 words max)

**Note:**

- **Research/enquiry Based:** L&T\_Based on student-centred enquiry and research activities (conducting research).
- **Research Tutored:** L&T Emphasises learning focused on students actively discussing research, and critically engaging with research outputs
- **Research Led:** T&L structured around subject content and that content is based on the research (learning about research)
- **Research Orientated:** T&L Emphasises understanding of the knowledge production process, and methods of enquiry in the subject (learning how to research)



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As research may be described as creating and finding new knowledge or using new knowledge to reach and support decisions, your investigation will draw upon all four modes of Research Rich Learning. This may be through the use of existing knowledge to define and plan your Open ended Design project; understanding new knowledge is created in your discipline area; creating new knowledge during your Open ended Design project and practical works; developing your skills of enquiry, practical working, data analysis, prototyping, etc.; and presenting and documenting the results of your process of knowledge creation.



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

<i>Complete for each delivery mode where the distribution of NSW</i>							
<b>Full Time Mode of Delivery</b>				<b>Part Time Mode of Delivery</b>			
<b>Activity type</b>	<b>Hours</b>	<b>KIS category</b>	<b>KIS category hours</b>		<b>Hours</b>	<b>KIS category</b>	<b>KIS category hours</b>
Lecture	30	Scheduled	50	Lecture		Scheduled	
Seminar	10			Seminar			
Tutorial				Tutorial			
Project Supervision				Project Supervision			
Demonstration				Demonstration			
Practical classes and workshops				Practical classes and workshops			
Supervised time in studio/ workshop	10			Supervised time in studio/ workshop			
Fieldwork				Fieldwork			
External visits				External visits			
Tutor guided independent learning				Independent	50		Tutor guided independent learning
Student independent learning	50	Student independent learning					
Placement		Placement		Placement		Placement	
Study abroad				Study abroad			
Work based learning				Work based learning			
<b>Total workload</b> <i>200 hours for 20 credit module</i>	<b>100</b>		<b>100</b>	<b>Total workload</b>			



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**Summative Assessment**

Sequence 001, 002 etc.	Activity type <i>indicate ONE of the following types:</i>	Brief description of assessment (max.120 characters) <i>e.g. type/ length of exam, type/ word limit of coursework</i>	Weighting % or Pass/Fail (for grade only components) <i>Note: % weightings should add up to 100% for module overall</i>	Final assessment		Anonymous submission		ESAF submission	
				Yes	No	Yes	No	Yes	No
001	CW (Coursework)	Assignments Short presentation (10 min)	20%	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
002	PRE (Presentation)	Group project Midterm presentation (10 min) Midterm report (1000 words)	30%	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
003	PRE (Presentation)	Group project Final presentation (20 min) Final report (3000 words)	50%	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Reassessment (specify either synoptic or non-synoptic)**

<b>Synoptic reassessment</b> <i>One form of reassessment that tests all module learning outcomes</i>	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
<b>Non-synoptic reassessment</b> <i>Where module referred overall, individual failed components of assessment are reassessed</i>	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>



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Date of FPARSC Approval

[Click here to enter a date.](#)

<b>Date of entry onto SITS</b>	<a href="#">Click here to enter a date.</a>
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<b>LOG OF CHANGES POST-APPROVAL</b>
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Please indicate any changes to the approved module descriptor from 2012/13 onwards

Section No.	Brief description of change	Date of Approval	Semester and year of first implementation
		<a href="#">Click here to enter a date.</a>	
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## Appendix 1

**Indicative Reading for PFNA alignment approval only** *(to be completed only if e-reading list unavailable at point of alignment approval)*

N.B. This outline indicative reading list will be utilised for approval purposes only, and **a full e-reading list must be produced and available by the June of the academic year prior to the first delivery date of the module** (at which point the section of p.2 referring to University Library Reading Lists should be completed).

Please list below essential key text underpinning the module content and ultimately the learning outcomes:

- 1) The Mechanical Design Process by David G. Ullman (McGraw-Hill 2004)
- 2) Product Design and Development by Karl T. Ulrich and Steven D. Eppinger (McGraw-Hill 2008)
- 3) Engineering Design Methods by Nigel Cross (Wiley 2008)