Northumbria University Programme Framework for Northumbria Awards - Module Specification

Faculty	Engineering and Environment	**Department**	BEng (Hons) Mechanical Engineering (Manufacturing Systems and Design), SeoulTech	**Subject**		**Module Tutor**	Kwanlae KIM

Module Title	Individual Research Project (MSDE 425)					**Module Code**	MSDE 425

Module Type* *(see key below)*	**STAN**						

Module size credits	**Level 3:**		**Level 4:**		**Level 5:**		**Level 6:** 10	**Level 7:**

Home programme/s for which the module is designed		BEng (Hons) Mechanical Engineering (Manufacturing Systems and Design), SeoulTech		**Code/s**	

Additional Programme/s other than that/those for which the module for specifically designed				**Code/s**	

Delivery Pattern (Please tick)	**Semester based** *(please specify)*	Sem 1 ☐ Sem 2 ☒	**Year Long**	☐	**Full-time** ☒ **Part-time** ☐ **Distance Learning** ☐

Location(s) of delivery: If delivered at EPWO partners please give partner name and location	SeoulTech, Korea (ROK)

Module Overview (<mark>Max 250 words per section</mark>) (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)

What will I learn on this module? (SRS 0001) Please give a brief indication of the content of the module including the main topic / subject areas studied
This module is designed to foster independent research skills, critical thinking, and in-depth subject knowledge. Through your Individual Research Project, you will learn to • Formulate clear research questions or objectives. • Conduct a comprehensive literature review. • Plan and execute a research project independently. • Collect and analyze data or evidence. • Interpret findings and draw valid conclusions. • Communicate research outcomes effectively through written and/or oral presentations. • Demonstrate self-motivation, time management, and project management skills.
How will I learn on this module? (SRS 0002) Please provide a brief overview the learning and teaching approaches the student can expect to experience.
Learning on this module is self-directed and research-based. You will: • Identify and propose your research topic of interest. • Work closely with a designated academic supervisor who will provide guidance and support. • Attend research workshops or seminars to enhance your research skills. • Access relevant resources, such as libraries, databases, and laboratory facilities. • Engage in critical reflection, feedback, and iterative refinement of your project. • Present your findings to peers, supervisors, or the wider academic community.
How will I be supported academically on this module? (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.
Academic support is integral to your success in the Individual Research Project. You will receive: • Assigned academic supervisor with expertise in your research area. • Regular one-on-one supervision meetings to provide guidance, feedback, and address your queries. • Access to research training and workshops to enhance your methodological and academic skills. • Assistance in accessing and utilizing research resources and facilities. • A clear assessment and feedback structure to monitor your progress.

What will I be expected to read on this module? (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: http://readinglists.northumbria.ac.uk

(Reading List service online guide for academic staff, this contains contact details for the Reading List team – http://library.northumbria.ac.uk/readinglists)

Northumbria University Library Reading List Service (please confirm the following)	Please give date added
A draft reading list has been created and on the university Library Reading List Service	Click here to enter a date.
Reading material has been acquired and digitised (following approval)	Click here to enter a date.
Reading list has been published to students (for module delivery)	Click here to enter a date.

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

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

What will I be expected to achieve? (SRS 0005)	**How will I be assessed?** (SRS 0006) *Please give details of all formative and summative assessment process indicating which MLOs will be addressed and how feedback will be provided.*	**Programme (Level) Learning Outcomes that this module contributes to:** *[Please insert PLO number as listed on the programme specification]*
- C4: Select and evaluate technical literature and other sources of information to address complex problems. - 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 & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards. - C8: Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct. - C9: Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity. - C10: Adopt a holistic and proportionate approach to the mitigation of security risks. - C11: Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.	**Formative Assessment** You will receive formative feedback on your weekly progress from your adviser during your supervision sessions, this may be verbal, written or electronic. **Summative Assessment** Component 1: Weekly Reports (1 page) Component 2: Final Report (min 25 pages) & Presentation (20 mins) Component 3: Mid-term Presentation (20 mins)	**Knowledge & Understanding:** - KU1: Evaluate and apply complex knowledge of the scientific and mathematical principles of engineering to solve Real-World problems. - KU4: Define and investigate complex problems and constraints that occur in engineering design with the aid of advanced tools. **Intellectual / Professional skills & abilities:** - IPSA1: Apply advanced approaches to solving unfamiliar real world engineering problems. - IPSA4: Ability to create innovative, sustainable critically evaluated solutions to complex engineering problems. **Personal Values Attributes** (Global / Cultural awareness, Ethics, Curiosity) (PVA): - PVA2: Critically analyse advanced solutions to complex engineering problems.

- C14: Discuss the role of quality management systems and continuous improvement in the context of complex problems.
- C15: Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.
- C18: Plan and record self-learning and development as the foundation for lifelong learning/CPD.

Pre-requisite(s) (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	MSDE 240 (Electronic Circuits) MSDE 220 (CAD I) MSDE 323 (Design of Machine Element) MSDE 231 (Introduction to Manufacturing) MSDE 324 (Intermediate Engineering Design)
Co-requisite(s) (SRS 0008) Modules at this level which must be taken with this module	

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.

The "Individual Research Project" module is designed to empower students with the skills and knowledge necessary for conducting independent, in-depth research. In this module, you will embark on a personal journey of exploration, investigation, and discovery, guided by experienced academic supervisors. By the end of the module, you will have honed your research, critical thinking, and communication skills, equipping you for a future of academic excellence and professional achievement. This module represents an opportunity for you to make a meaningful contribution to your field of study, and to demonstrate your capacity to engage in advanced, self-directed research.

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)

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 individual research project; understanding new knowledge is created in your discipline area; creating new knowledge during your individual research 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.

Notional Student Workload (NSW) for each mode of delivery

Complete for each delivery mode where the distribution of NSW **Full Time Mode of Delivery**				**Part Time Mode of Delivery**			
Activity type	**Hours**	KIS category	KIS category hours		**Hours**	KIS category	KIS category hours
Lecture		Scheduled	60	Lecture		Scheduled	
Seminar	10			Seminar			
Tutorial	10			Tutorial			
Project Supervision	20			Project Supervision			
Demonstration				Demonstration			
Practical classes and workshops				Practical classes and workshops			
Supervised time in studio/ workshop	20			Supervised time in studio/ workshop			
Fieldwork				Fieldwork			
External visits				External visits			
Tutor guided independent learning	10	Independent	40	Tutor guided independent learning		Independent	
Student independent learning	30			Student independent learning			
Placement		Placement	0	Placement		Placement	
Study abroad				Study abroad			
Work based learning				Work based learning			
Total workload *200 hours for 20 credit module*	*100*		*100*	**Total workload**			

Summative Assessment

Sequence 001, 002 etc.	Activity type *indicate ONE of the following types:*	Brief description of assessment (max.120 characters) *e.g. type/ length of exam, type/ word limit of coursework*	Weighting % or Pass/Fail (for grade only components) *Note: % weightings should add up to 100% for module overall*	Final assessment		Anonymous submission		ESAF submission	
				Yes	*No*	*Yes*	*No*	*Yes*	*No*
001	CW (Coursework)	Weekly Reports (1 page)	10	☐	☒	☐	☒	☐	☐
002	CW (Coursework)	Final Report (min 25 pages) & Presentation (20 mins)	50	☒	☐	☐	☒	☐	☐
003	PRE (Presentation)	Mid-term Progress Presentations (20 mins)	40	☐	☒	☐	☒	☐	☐
004	Choose an item.			☐	☐	☐	☐	☐	☐
005	Choose an item.			☐	☐	☐	☐	☐	☐
006	Choose an item.			☐	☐	☐	☐	☐	☐
007	Choose an item.			☐	☐	☐	☐	☐	☐
008	Choose an item.			☐	☐	☐	☐	☐	☐
009	Choose an item.			☐	☐	☐	☐	☐	☐
010	Choose an item.			☐	☐	☐	☐	☐	☐
011	Choose an item.			☐	☐	☐	☐	☐	☐
012	Choose an item.			☐	☐	☐	☐	☐	☐

Reassessment (specify either synoptic or non-synoptic)

Synoptic reassessment *One form of reassessment that tests all module learning outcomes*	Yes	☐	No	☒
Non-synoptic reassessment *Where module referred overall, individual failed components of assessment are reassessed*	Yes	☒	No	☐

Date of FPARSC Approval	Click here to enter a date.

Date of entry onto SITS	Click here to enter a date.

LOG OF CHANGES POST-APPROVAL

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
		Click here to enter a date.	
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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)   Shigley's Mechanical Engineering Design, Richard G. Budynas and J. Keith Nisbett, 8th Edition, 2008
2)   Product Design and Development by Karl T. Ulrich and Steven D. Eppinger (McGraw-Hill 2008)
3)   Control Systems Engineering 4th Edition, Norman S. Nise, Wiley, 2003

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