School/Department: Electronic and Mechanical Engineering
Date: 8 May 2020
Title of the Programme: Bachelor of Engineering (Hons) in Biomedical Engineering (240 ECTS) Proposed Revisions to 3 modules in the Bachelor of Engineering in Electronic Engineering and Bachelor of Engineering (Hons) in Electronics and Embedded Systems.
Chairperson: Dr Andrew Power, Registrar, IADT.
Members of the Panel: Dr Andrew Power, Registrar, IADT, Professor Madeleine Lowery, UCD, Professor Laoise McNamara, NUI Galway, Christina Mc Fadden, Randox and Mohammed Saad Abbas, Research Masters, Letterkenny IT.

Secretary: Dr Anne Burke
LYIT Staff: Denis McFadden (HOS), Dr Jim Morrison (HOD), Christopher Mc Eleney, Louise Duggan, Anne Carney, John Hynes, Martin Bradley, Dr Paddy Hannigan, Dr Nick Timmons, Dr Kim McFadden, Maureen O'Neill

Criteria for the Validation of a New Programme

1. The Programme Aims and Objectives are clear and consistent with the Award sought.

2. The Programme concept, implementation strategy are well informed and soundly based.

3. The Programme's Access, Transfer and Progression arrangements are satisfactory.

4. The Programme's written curriculum is well structured and fit for purpose.

5. There are sufficient qualified and capable programme staff.

6. There are sufficient physical resources to implement the programme as planned.

7. The learning environment is consistent with the needs of the programme learners.

8. There are sound Teaching, Learning and Assessment Strategies.

9. Learners enrolled on the Programme will be well informed, guided and cared for.

10. The Programme will be well managed.

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(For the attention of the Academic Council)

Commendations:

1. The strong engineering technical foundation underpinning the programme and the commitment by the Programme Director to ensuring that students obtain the core competencies required of Bioelectronic Engineers.
2. The programme addresses a gap for Biomedical engineers with expertise in bioelectronics and embedded systems relevant to medical technologies industries.
3. Appropriate balance between engineering and biomedical sciences within the programme.
4. Relatively long duration of work placement is a strength
5. Good relationship with industry.

The Panel of Assessors advises the Academic Council that approval of the programmes subject to general conditions of approval together with the following additional conditions:

Bachelor of Engineering (Hons) in Biomedical Engineering (240 ECTS)

1. Biomedical Case Studies to be renamed to include Regulatory Affairs in the title, and that the regulatory content to be expanded within the module, e.g. include ISO 13485, ISO 14971, FDA, CE Marking, HPRA approval processes and regulatory pathways, EMC standards such as EN 61326, electrical safety standards such as EN61010 etc.
[done – Page 86]
2. Inclusion of a basic Mechanics (or ideally a Biomechanics) module in the early stages of the programme.
[done – Page 22]

The Panel of Assessors advises the Academic Council that the Institute and the School/Department should take cognisance of following recommendations:

Bachelor of Engineering (Hons) in Biomedical Engineering (240 ECTS)

1. Consider including an Electromagnetics Module in the programme.
[will be addressed in next PPE]
2. To accommodate these additional new modules could remove some management modules.
[noted]
3. Incorporate a biomedical perspective in the Digital Signal Processing (DSP) Module, for example through practical labs and in class examples.
[done – Page 76]
4. In modules in which software is taught students should be introduced to version control methodology.
[done in Programming 1 (P35), Embedded Systems 1 (P74) and Project 2 (P112)]
5. Given the condition of introducing a Mechanics Module, the content of the Biomaterials module should be revisited to include for example biomaterials laboratory sessions.
[done – Page 45]
6. Review the content of new modules to avoid overlap with existing engineering modules.
[ongoing – next PPE]

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7. Further consideration of work placement needed in the context of competition with other third level institutions (review need to define work placement project and the likelihood of some students needing to move outside region).

[main point done (P79) and issue will be tracked through implementation]

8. The resourcing requirements for the programme should be kept under review, e.g. in time a dedicated biomedical lab may be needed as it was not possible to validate the physical resources that already exist for the other programmes currently running.

[ongoing – to be addressed as programme is implemented]

Proposed Revisions to 3 modules in the Bachelor of Engineering in Electronic Engineering and Bachelor of Engineering (Hons) in Electronics and Embedded Systems

1. Changes approved as recommended – however in order to ensure the content and level of mathematics is maintained a PLO should be amended and it would useful to amend a MLO in modules the content previously included in Maths 6.

[to be done before implementation]

PART 4 PROPOSED PROGRAMME SCHEDULE(S) please attach final schedule to bottom of the report.

[see following pages]

Programme Schedules

Year 1 Semester 1

Module number	Semester	Title of examination module	Module status	ECTS credits		Contact hours (per week)					Allocation of marks				
				Level	Number	Lecture	Tutorial	Practical	Independent	Total	CA	Project	Practical	Final	Max
1	1	Mathematics 1	M	6	5	3	1		4	8	25			75	100
2	1	Biomechanics	M	6	5	3		2	3	8	25			75	100
3	1	Chemistry 1	M	6	5	3		2	3	8	50			50	100
4	1	Introductory Biology	M	6	5	3		2	3	8	50			50	100
5	1	Digital Fundamentals	M	6	10	4		2	11	17	25			75	100

Year 1 Semester 2

Module number	Semester	Title of examination Module	Module status	ECTS credits		Contact hours (per week)					Allocation of marks				
				Level	Number	Lecture	Tutorial	Practical	Independent	Total	CA	Project	Practical	Final	Max
1	2	Mathematics 2	M	6	5	3	1		4	8	25			75	100
2	2	Programming 1	M	6	10	2		4	11	17	50			50	100
3	2	Electrical Technology	M	6	5	2		2	4	8	25			75	100
4	2	Introduction to Anatomy and Physiology	M	6	10	4		2	11	17	40			60	100

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Year 2 Semester 3

Module number	Semester	Title of examination Module	Module status	ECTS credits		Contact hours (per week)					Allocation of marks				
				Level	Number	Lecture	Tutorial	Practical	Independent	Total	CA	Project	Practical	Final	Max
1	3	Mathematics 3	M	6	5	3	1		4	8	25			75	100
2	3	Introduction to Biomaterials	M	6	5	2		2	4	8	40			60	100
3	3	Analogue Electronics 2	M	6	10	4		2	11	17			50	50	100
4	3	Micro-controllers	M	6	5	2		2	4	8	25			75	100
5	3	Biomedical Instrumentation	M	6	5	2		2	4	8	40			60	100

Year 2 Semester 4

Module number	Semester	Title of examination Module	Module status	ECTS credits		Contact hours (per week)					Allocation of marks				
				Level	Number	Lecture	Tutorial	Practical	Independent	Total	CA	Project	Practical	Final	Max
1	4	Mathematics 4	M	6	5	3	1		4	8	25			75	100
2	4	Analytical Chemistry	M	6	5	2		2	4	8	40			60	100
3	4	Instrumentation	M	6	5	2		2	4	8	25			75	100
4	4	Digital Communications and Transmission	M	6	5	3		2	3	8	25			75	100
5	4	Analogue Electronics 3	M	6	10	4		2	11	17			50	50	100

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Year 3 Semester 5

Module number	Semester	Title of examination module	Module status	ECTS credits		Contact hours (per week)					Allocation of marks				
				Level	Number	Lecture	Tutorial	Practical	Independent	Total	CA	Project	Practical	Final	Max
1	5	Mathematics 5	M	7	5	3	1		4	8	25			75	100
2	5	Biomedical Imaging	M	7	5	2		2	4	8	25			75	100
3	5	Project 1	M	7	5	1		2	4	8		100			100
4	5	Embedded Systems 1	M	7	10	4		2	11	17	25			75	100
5	5	Digital Signal Processing	M	7	5	2		2	4	8	50			50	100

Year 3 Semester 6

Module number	Semester	Title of examination module	Module status	ECTS credits		Contact hours (per week)					Allocation of marks				
				Level	Number	Lecture	Tutorial	Practical	Independent	Total	CA	Project	Practical	Final	Max
1	6	Placement	M	7	15		1		35	36	25			75	100
2	6	Engineering Management	M	7	10		1		16	17	25			75	100
3	6	Introduction to Regulatory Affairs in Manufacturing	M	7	5		1		7	8	25			75	100

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Year4 Semester 7

Module number	Semester	Title of examination module	Module status	ECTS credits		Contact hours (per week)					Allocation of marks				
				Level	Number	Lecture	Tutorial	Practical	Independent	Total	CA	Project	Practical	Final	Max
1	7	Data Science	M	8	5	3	1		4	8	100				100
2	7	Electro-Analytical Chemistry	M	8	5	2		3	3	8	40			60	100
3	7	Embedded Systems 2	M	8	5	2		2	4	8	40			60	100
4	7	Communications Technologies for Embedded Systems	M	8	5	3		2	3	8	30			70	100
5	7	Design Project 2	M	8	5	1		3	4	8		100			100
6	7	Innovation, Technology and Business	M	8	5	1			7	8	100				100

Year 4 Semester 8

Module number	Semester	Title of examination module	Module status	ECTS credits		Contact hours (per week)					Allocation of marks				
				Level	Number	Lecture	Tutorial	Practical	Independent	Total	CA	Project	Practical	Final	Max
1	8	Machine Learning	M	8	5	3	1		4	8	100				100
2	8	Embedded Systems 3	M	8	5	2		2	4	8	40			60	100
3	8	Networking of Embedded Systems	M	8	5	3		2	3	8	30			70	100
4	8	Project 2	M	8	10	1		3	13	17		100			100
5	8	Professional Practice	M	8	5	1			7	8	100				100

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Programme Evaluation Report Approved by:

Dr Andrew Power

Chair to Panel

(Registrar, IADT)

Date 10/12/20

Billy Bennett

(VP for Academic Affairs and Registrar, Letterkenny IT)

Date 10/12/20

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