EXTERNAL REVIEW REPORT OF NEW PROGRAMMES

1.	Title of Programme(s):	BEng in Software & Electronic Engineering Higher Certificate in Software & Electronic Engineering (embedded Exit Award)					
2.	School / Centre:	School of Engineering					
3.	Duration:	3 years Level 7					
4.	NFQ Level: ISCED Code:	Level 7 0714					
5.	Type of Review:	New Programme:	Yes:		No:	X	
		Differential Validation:	Yes:	X	No:		
6.	Date of Review:	4th April 2017					
7.	Delivery Mode:	Full-time	X	Part-time		Blended	
8.	Panel Members:	Dr Des Foley, Chair Dr Ian McLoughlin Mr John Scahill Mr John Costello, Cisco Ms Carmel Brennan, Secretary					
9.	Proposing Staff:	Mr Gerard MacMichael Mr Des O'Reilly Ms Michelle Lynch Ms Natasha Rohan Mr Paul Dunne Mr George Anderson Mr Mairtin O'Conghaile Mr Mike Fahy Mr Sean O'Donovan Mr Brian O'Shea					

10	Programme Rationale:	The Department of Electronic Engineering have had a four-year level 8 Software & Electronic Engineering programme validated (with embedded level 7 and 6 exit awards), and now through the differential validation process wish to get a three-year level 7 degree comprising the first three years of the level 8 programme approved. Electronic engineering is an overarching construct, which includes hardware technology, software technology, and the integration of both, in application areas including communications, networking, information technology, automotive, medical, entertainment, mobile technologies and the internet of things. The term electronic engineering is universally used to describe similar programmes nationally and internationally, and as a term it has persevered through many iterations of technological development. Engineering emphasises the engineering ethos of the programme, the application of scientific, mathematical, social and economic principles in today's world. Software engineering is a major stream within this programme, including design methodologies, test methodologies, using industry standard tools, and programming in several of the top programming languages. A major area of opportunities for graduates, is as software engineers, in the field of electronic engineering, in the ICT industry. While much of the employment in the software and electronic engineering area is for level 8 graduates, there is convincing evidence of employment opportunities at technician level for level 7 graduates in many employers in the region. Work placement, which is included in the new programme in Year 3, will assist those completing the level 7 programme in securing work experience, and potentially jobs. Students will also have the opportunity to progress to year 4 of the level 8 degree if they wish, dependent on places being available.
11.	Potential Demand for Entry:	Projected student numbers for the first year are 40 students (combined figure for the level 7 and 8 programmes).

12.	Stakeholder Engagement:	In designing the programme, the team considered the evolution of technology and industry since the last time a major programme design or review was undertaken. An industry and graduate network provided input to the design process on current needs and trends. Requirements in the Western, Mid-Western and Midlands regions were analysed. The programme is differentiated by its situation in the region, where the tech industry has evolved to be largely research and development focused, rather than manufacturing based. Many global players in the tech industry reside here, and many local start-ups require electronic engineering and software engineering skills. This programme specifically targets this highly skilled research and development industry. Thirty-six companies were consulted and surveyed, researching their requirements for new hires in relation to qualifications, knowledge and skills, and their views on work placement Other Institutes of Technology were consulted about their experiences of moving from the two-year add-on to the ab-initio 4-year programme.
13.	Graduate Demand:	Employment potential for graduates from this programme is excellent due to the following factors: • The high demand for graduates with ICT/software/electronic engineering skills • The current programmes are well regarded by local industry • The programme has strong emphasis on lab-based skills • Work placement The Programme Board have identified opportunities for level 7 graduates in the electronics industry, the software industry and the biomedical industry.
14.	Entry Requirements:	Students must meet the entry requirements as indicated in GMIT's Academic Code of Practice No. 4 (Access, Transfer

		and Progression), at any given time. Students will also need a grade C2/O4 or higher in Leaving Certificate ordinary level Mathematics to meet the minimum entry requirements for the programme.
15.	Programme Structure:	The programme includes cognate modules from the following disciplines: • Electrical and Electronic Theory • Programming • Operating Systems • Embedded Systems • Information and Communications Technology • Mathematics The knowledge and skills developed in these modules will be supplemented by non-cognate modules in the areas of business and personal development. In Semester 3, students select a year-long 5-credit module from Civic Engagement, Peer Assisted Study Sessions or Communication Skills. In Semester 6, students may opt for Work Placement or take alternative modules. Either option carries 30 credits. Project work and work placement offer students the opportunity to develop and apply their skills in a practical and supportive environment.
16.	LTA:	The learning and teaching strategies employed by the programme team aim to help students achieve module and programme learning outcomes. Inevitably, there will be variations in the methodologies employed by lecturers; however certain core principles apply as a generality. These are: ○ The learning style broadly favoured in all modules is 'learning by doing'. To this end, at a minimum, for every two-hour class time, the student will spend two hours in the laboratory. In some modules, all classes are delivered in a laboratory. ○ The programme is designed to foster the student's skill at self-learning. Teaching, delivery methods and assessment are all focused on this aim.

		○ Practical work can be set as an individual assignment, paired assignment, or team assignment. ○ Moodle forms the key platform on which all modules rest. It acts as the repository for module learning material and is the central conduit for the setting and gathering of assessments and assignments. Assessment is a key student motivator and provides employers with indicators as to the quality of our graduates. Its design & implementation is critical to achieving the learning outcomes of the programme. In assessing students, lecturers adhere to *Academic Code of Practice No. 3 (Student Assessment Marks & Standards),* which complies with QQI's Assessment and Standards document. Modules are assessed with either 100% continuous assessment or a 50:50 division between continuous assessment and an end of module exam. This is in keeping with the philosophy of the programme which aspires to produce self-directed, knowledgeable graduates with high levels of practical skills. Both continuous assessment and the final exam may be comprised of lab based, practical work and/or written submissions. All methods of assessment are subject to quality assurance in accordance with Code of Practice No. 3. This assessment strategy is prepared by the programme board, and is the subject of continuous review.
17.	ATP:	Students may progress to stage 4 of the BEng (Hons) in Software & Electronics Engineering.
18.	Resource Implications:	The School of Engineering has sufficient lecturer capacity with relevant skill sets to deliver the proposed programme. Whilst no new facilities or equipment is specifically required to deliver this programme, the upgrading envisaged in the School of Engineering Campus Development Plan will be necessary in the future.
19.	Synergies with existing programmes:	This programme is common with the first three years of the BEng (Hons) in Software & Electronic Engineering.

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<tr><td rowspan="3">20.</td><td rowspan="3">Findings and Recommendations:</td><td>Special conditions attaching to approval (if any):</td></tr>
<tr><td>The Learning & Innovation Skills Module ELEC07068 should be replaced by the Institute approved module EDUS06001. The programme board can and should tailor the content of the module to reflect the discipline that the students are studying.</td></tr>
<tr><td>Recommendations of the panel in relation to award sought:

1. The panel very strongly recommends the revision of the programme title to ‘BEng in Electronic Engineering & Software’, which more clearly reflects the content and balance of themes of the three-year level 7 programme.

2. Specific Module Recommendations
Review the following modules and amend as indicated:
• Industrial Automation 1A: Insert Teaching, Learning and Repeat assessment strategies.
• Electronic Circuits 1 and 2: Update book resources, as relevant.
• Electronic Design Automation: Review Short Title as this is what appears on the student transcript.
• Advanced Java: Remove prerequisite module.
• Work Placement: Supervision hours need to be included in module descriptor and in APS.
• Applied Project Management: Remove prerequisite module.
• Project: Remove 100% attendance requirement.
• Lean Enterprise Engineering: Include Teaching, Learning, Assessment and Repeat Assessment strategies.
• Applied Linux: Remove prerequisite module.
• Software Programming: Correct spelling of module title.
• Introduction to C: Short title should be the same as long title.</td></tr>
<tr><td>22.</td><td>FAO: Academic Council:</td><td></td></tr>
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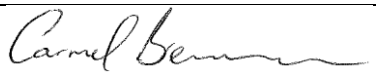
		Approved:	
		Approved subject to recommended changes:	X
		Not approved at this time:	
	Signed:		
			
		Chair	Secretary