



APPROVED

Awards			
Master of Engineering			
Programme Code:	BN_EMIOT_R	Mode of Delivery:	Full Time, Part Time
		No. of Semesters:	3
NFQ Level:	9		
Programme Credits:	90		
Institute Code:	BN535R		
Department:	Engineering		
Programme Extra Information:	60 credits taught with a 30 credit research project This programme will focus on the rapidly emerging technologies and services surrounding the 'Internet of Things', i.e., the network of connected devices that is now becoming the norm in everyday life and business. The taught elements will be delivered primarily Online, using ITB's established expertise in online delivery of engineering programmes. 20 credits to be taken from electives in semester 2		

Programme Outcomes

On successful completion of this programme the learner will be able to :

PO1	Knowledge - Breadth	
	(a)	A systematic understanding of knowledge, at, or informed by, the forefront of Internet of Things enabling technologies.
	(b)	Has comprehensive knowledge and understanding of a wide range of mathematical methods and the underlying theory, relevant to complex engineering problems in Internet of Things Systems.
	(c)	Has a comprehensive knowledge and understanding of scientific principles underpinning Internet of Things enabling technologies.
	(d)	Has sufficient knowledge and understanding of development environments, toolchains and necessary ICT to solve Internet of Things based engineering problems.
	(e)	Has a wide knowledge and comprehensive understanding of software and systems design process and methodologies appropriate for Internet of Things systems.
	(f)	Understands the economic implications of engineering in Internet of Things development projects. Understands the elements of project management necessary to define and complete a project in a specified time-frame.
	(g)	Understands the key parameters and the technical, economic, environmental and social issues which pertain to development and deployment of Internet of Things technologies.
PO2	Knowledge - Kind	
	(a)	Is aware of the latest mathematical techniques and their limitations and applicability to the solution of ill-defined engineering problems in Internet of Things systems design.
	(b)	Has comprehensive knowledge and understanding of the principles of developing scientifically based models of Internet of Things networks and systems and the approaches taken in incorporating a range of scientific principles into Internet of Things based engineering projects.
	(c)	Has knowledge and understanding of ICT required to solve ill-defined complex problems in Internet of Things systems engineering.
	(d)	Has a fundamental understanding of the context and range of complex engineering problems necessary to specify, plan and implement projects. Is aware of the latest/newest design methodologies and their advantages and limitations.
	(e)	Understands and can justify the cost implications and commercial potential for engineering projects. Understands the relationship between the role of engineering and other disciplines.
	(f)	Understands how new insights in engineering can be transferred into practical engineering applications.
PO3	Skill - Range	
	(a)	Can identify and develop appropriate mathematical methods and apply them to new and ill-defined complex engineering problems. Can derive and apply solutions from this knowledge. Can create models by deriving appropriate equations and formula and by specifying boundary conditions and underlying assumptions. Can incorporate aspects of engineering outside of their own specialisation into projects.
	(b)	Can be innovative in the use of scientific principles in solving ill-defined engineering problems. Can use scientific principles in the analysis and modelling of engineering systems, processes and products.

	(c)	Can demonstrate mastery of the technologies relevant to Internet of Things systems engineering. Can select, modify and use appropriate technologies to solve complex engineering problems. Can specify the technical performance requirements and develop soft and hard tools to solve complex engineering problems.
	(d)	Can apply knowledge and understanding of the design process in ill-defined, complex engineering situations. Can use engineering principles to design and develop new Internet of Things systems. Can engage in the creative and innovative development of engineering technology and continuous improvement systems.
	(e)	Can manage ill-defined complex projects and act as an expert on specific areas of Internet of Things technology and engineering.
	(f)	Can identify, formulate, analyse and solve engineering problems. Can maintain and extend a sound theoretical approach in enabling the introduction and exploitation of new and advancing Internet of Things based technology and other relevant developments. Can manage and conduct complex engineering projects in Internet of Things systems engineering.
PO4	Skill - Selectivity	
	(a)	Can research and use new methods required for novel situations. Can identify inconsistencies in data and detect misleading impressions from data.
	(b)	Can model and analyse complex engineering systems, processes and products using scientific principles and recognise the limitations of such analysis.
	(c)	Can specify the technical requirements of, and develop software tools and numerical packages and manage the resources required to solve ill-defined complex engineering problems.
	(d)	Can undertake analysis of the design and justify decisions throughout a particular design process. Can demonstrate innovation in the design and creation of new systems, components or processes. Can implement design solutions and manage the design process for ill-defined engineering problems.
	(e)	Can prepare budget submissions and justify costs for ill-defined complex engineering situations, in a format understandable to engineers and non-engineers. Can prepare clear project proposals and funding submissions for specific projects related to solving ill-defined complex engineering problems.
	(f)	Can create and manage novel engineering solutions for real life ill-defined complex engineering problems.
PO5	Competence - Context	
	(a)	In the context of ill-defined complex engineering situations can: 1. adapt existing and new engineering techniques for novel and unfamiliar situations; 2. take account of risk assessment and social and environmental impacts in setting constraints on design; 3. identify potential projects and opportunities; conduct appropriate research and undertake the design and development of engineering solutions; 4. achieve continuous improvement through quality management and plan for effective project implementation.
PO6	Competence - Role	
	(a)	In the context of ill-defined complex engineering situations can: 1. lead teams and develop staff to meet changing technical and managerial needs; 2. lead the improvement of relevant engineering systems and processes incorporating /suggesting the latest technologies and procedures; 3. plan, budget, organise, direct and control tasks, people and resources; 4. communicate with, work with and manage nontechnical personnel in the execution of projects; 5. initiate, plan and manage new project proposals; 6. lead the improvement of relevant engineering systems and processes
PO7	Competence - Learning to Learn	
	(a)	Can publish own work in peer-reviewed journals and present own work. Can identify knowledge gaps and source and undertake self-learning to fill the gaps. Can explain a problem, or a lack of understanding.
PO8	Competence - Insight	

	(a)	Can identify and articulate the key parameters and issues of a problem. Can critically comment on the technical, economic, environmental and social implications of own work and work of others.
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Semester Schedules

Stage 1 / Semester 1

Mandatory	
Module Code	Module Title
MIOT H6011	Embedded Systems
MIOT H6012	Information Transmission & Management
MIOT H6013	Software Engineering
MIOT H6023	Research Project (Part 1: Research Methods)

Stage 1 / Semester 2

Mandatory	
Module Code	Module Title
MIOT H6015	IoT Systems
MIOT H6016	Secure Communication & Cryptography
MIOT H6014	Statistical Analysis for Engineers

Elective	
Module Code	Module Title
MIOT H6018	Technology & Innovation Management
MIOT H6019	Geodata Provision
MIOT H6020	Advanced Signal Processing
MACS H6011	Network Security
ADSA H6018	Programming for Big Data

Stage 1 / Semester 3

Mandatory	
Module Code	Module Title
MIOT H6022	Research Project 30 (Part 2: Implementation)