LEVEL 5 DIPLOMA IN CYBER SECURITY APPLICATIONS AND TECHNOLOGY DEVELOPMENT

CURRICULUM FOR DIPLOMA IN CYBER SECURITY APPLICATIONS AND TECHNOLOGY DEVELOPMENT BASED ON CREDIT SYSTEM

PROGRAMME LEARNING OUTCOMES (PLO):

I. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

II. Problem analysis Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

III. Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

IV. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions Manage Construction Projects for Planning, Analyzing, Costing, Scheduling, Predicting and complete within the stipulated period and fund.

V. Modern tool usage Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

VI. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

VII. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development, Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

VIII. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

IX. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

X. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME GUIDELINES	
PROGRAMME TITLE	**Level 5 Diploma in Cyber Security Applications and Technology Development**
QUALIFICATION CODE	**701/2523/2**
LEVEL	**LEVEL – 5**
TOTAL CREDITS	**120**
TOTAL LEARNING HOURS	**1200 HOURS**
GUIDED LEARNING HOURS	**480 HOURS**

Total learning hour 1200 Hours

1 Credit = 10 hours of effort (10 hours of learning time which includes everything a learner has to do to achieve the outcomes in a qualification including the assessment procedures and practical's).

Total Guided Learning Hours for Higher International Diploma in Cyber Security Applications and Technology Development is 480 hours.

HID IN CYBER SECURITY APPLICATIONS AND TECHNOLOGY DEVELOPMENT

COURSE STRUCTURE

YEAR	SEMESTER	UNIT SPECIFICATION	NO. OF. UNITS	UNIT CREDIT	CREDIT/YEAR
I	SEMESTER 1	Essential unit	1	20	120
		Essential unit	1	20	
		Essential unit	1	20	
	SEMESTER 2	Essential unit	1	20	
		Essential unit	1	20	
		Essential unit	1	20	
				TOTAL	**120**

LIST OF UNITS

S. No.	Subject Code	UNIT	UNIT SPECIFICATION	CREDIT
1	I/725/1041	Emerging cyber threats and vulnerabilities	Essential unit	20
2	I/725/1042	Cyber security: Awareness and Education	Essential unit	20
3	I/725/1043	Artificial Intelligence & Machine Learning in Cybersecurity	Essential unit	20
4	I/725/1044	Block Chain for cyber security	Essential unit	20
5	I/725/1045	Cybercrime Investigation & Digital Forensics	Essential unit	20
6	I/725/1046	Cyber-Physical Systems in cyber security	Essential unit	20

Semester : I
Year : 2
Credit : 60

UNIT CODE	UNIT	UNIT SPECIFICATION	CREDIT
I/725/1041	Emerging cyber threats and vulnerabilities	Essential unit	20
I/725/1042	Cyber security: Awareness and Education	Essential unit	20
I/725/1043	Artificial Intelligence & Machine Learning in Cybersecurity	Essential unit	20

Semester : II
Year : 2
Credit : 60

UNIT CODE	UNIT	UNIT SPECIFICATION	CREDIT
I/725/1044	Block Chain for cyber security	Essential unit	20
I/725/1045	Cybercrime Investigation & Digital Forensics	Essential unit	20
I/725/1046	Cyber-Physical Systems in cyber security	Essential unit	20

UNIT CODE : I/725/1041

UNIT TITLE : Emerging cyber threats and vulnerabilities

CREDIT : 20

SPECIFICATION : Essential Unit

UNIT DESCRIPTION

In this unit the learner will come across the emerging cyber security threats prevailing in all sectors from education, business, banking, finance and so on. What are the risk factors involved? How the attack happens? How cyber-crime prevails in different sectors? As a part of this unit learner will come to analyze the possible threats and vulnerabilities.

UNIT LEARNING OUTCOMES

ULO1 - Understand the basic concepts of cyber threat

UO2 -Understand the mechanism involved behind cyber threat

ULO3 - Understand the vulnerabilities involved in cyber threat

ULO4 - Understand the preventive measures against the cyber threats

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M		M	M		M	M		M
ULO2	M			M		M		M		
ULO3		M			M		M		M	M
ULO4	M			M		M		M		

UNIT CODE : I/725/1042

UNIT TITLE : Cyber security: Awareness and Education

CREDIT : 20

SPECIFICATION : Essential Unit

UNIT DESCRIPTION

In this unit the learner will get knowledge on the cyber-attack methods, signs and preventive measures over any security threat. Awareness regarding the security measures will be provided. Education on cyberattack, its awareness and impact. What are the impacts of cyber-attack? How to prevent the attack? As a part of this unit learner will come to understand the cyber threat awareness, how hoe to prevent it.

UNIT LEARNING OUTCOME

ULO1 – Understand the concepts and lifecycle of cyber threat
ULO2 – Understand the encryption algorithms involved for cyber security.
ULO3 - Understand how cyber security method helps in protecting data.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M			M	M		M	M	M
ULO2			M	M			M	M		
ULO3	M		M		M	M	M	M		M

UNIT CODE	:	I/725/1043
UNIT TITLE	:	Artificial Intelligence & Machine Learning in Cybersecurity
CREDIT	:	20
SPECIFICATION	:	Essential Unit

UNIT DESCRIPTION

In this unit the learner will get knowledge on how artificial intelligence is used to prevent cyber-attack. Role of AI in cyber security? How machine learning can be implemented to prevent cyberattacks? Measures proposed on protecting cyber-attacks. As a part of the unit learner will understand the key concepts on how to implement AI and ML for cybersecurity.

UNIT LEARNING OUTCOME

ULO1 - Understand how AI and ML is influencing various sectors on cyber-attack.
ULO2 - Understand how Machine learning is used for cyber attacks
ULO3 - Understand the best practices used by AI & ML to solve cyberattack in education sector.
ULO4 - Understand the use cases of ML in cyber security

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M		M	M		M	M	M	M
ULO2	M						M		M	
ULO3	M	M	M	M	M	M			M	
ULO4	M	M	M	M	M	M			M	

UNIT CODE : I/725/1044

UNIT TITLE : Block chain for cyber security

CREDIT : 20

SPECIFICATION : Essential Unit

UNIT DESCRIPTION

In this unit the learner will get knowledge on block chain to protect cyber-attacks methods, signs and preventive measures over any security threat. What is blockchain? How the attack happens and how to solve of the attack? How blockchain is implemented? As a part of this unit learner will come to understand block chain implementation for preventing cyber-attacks.

UNIT LEARNING OUTCOMES

ULO1 - Understand the basic concepts blockchain.

ULO2 - Understand the mechanism involved in block chain for cyber protection

ULO3 - Understand the technology risk involved in implementing blockchain for banking.

ULO4 - Understand the regulations and implementation of blockchain technology in business.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M		M	M		M	M		M
ULO2	M			M		M		M		
ULO3		M			M		M		M	M
ULO4		M			M		M		M	M

UNIT CODE : I/725/1045

UNIT TITLE : Cybercrime Investigation & Digital Forensics

CREDIT : 20

SPECIFICATION : Essential Unit

UNIT DESCRIPTION

In this unit the learner will get to know how cybercrime investigation and forensics are performing. the risk factors involved in crime investigation. Cybercrime investigation. forensics, cybercrime prevails in different sectors, develop application. As a part of this unit learner will come to understand the cybercrime investigations and forensics and app development.

UNIT LEARNING OUTCOMES

ULO1 - Understand the basic concepts of Cybercrime investigation and digital forensics.
ULO2 - Understand the laws in crime investigation and digital forensics.
ULO3 - Understand tools, techniques involved in digital forensics

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M		M	M		M	M		M
ULO2	M			M		M		M		
ULO3		M			M		M		M	M

UNIT CODE : I/725/1046

UNIT TITLE : Cyber-Physical Systems in cyber security

CREDIT : 20

SPECIFICATION : Essential Unit

UNIT DESCRIPTION

In this unit the learner will get to know the forefront of the cyber-physical systems (CPS) revolution, this unit provides an in-depth look at security and privacy, two of the most critical challenges facing both the CPS research and development community and ICT professionals. It explores, in depth, the key technical, social, and legal issues at stake, and it provides readers with the information they need to advance research and development in this exciting area. The learner can understand seamless integration of computational algorithms and physical components. Advances in CPS will enable capability, adaptability, scalability, resiliency, safety, security, and usability far in excess of what today's simple embedded systems can provide. Just as the Internet revolutionized the way we interact with information; CPS technology has already begun to transform the way people interact with engineered systems.

UNIT LEARNING OUTCOMES

ULO1- Understand the core principles behind CPS
ULO2- Understand abstraction in system designs and security challenges
ULO3- Identify CPS security threats and safety specifications and critical properties.

MAPPING

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
ULO1	M	M		M	M		M	M		M
ULO2	M			M		M		M		
ULO3		M			M		M		M	M

ASSESSMENT METHODS AND TECHNIQUES FOR HID IN FAÇADE ENGINEERING

Assessment technique	Type of Assessment	Description	Formative or Summative
Case studies	Oral/ Problem based/ Practical	Students are required to work through a case study to identify the problem(s) and to offer potential solutions; useful for assessing students' understanding and for encouraging students to see links between theory and practice. Case studies could be provided in advance of a time-constrained assessment.	**Formative**
Concept maps	Written/ Oral	Students map out their understanding of a particular concept. This is a useful (and potentially quick) exercise to provide feedback to staff on students' understanding.	**Formative**
'Doing it' exam	Written	An exam which requires students to do something, like read an article, analyze and interpret data etc.	**Formative / Summative**
Field report	Written/ Oral	Students are required to produce a written/ oral report relating to a field/ site visit.	**Formative**
Laboratory books / Reports	Practical/ Written	Students are required to write a report for all (or a designated sample) of practical's in a single lab book. A sample of lab books will be collected each week to mark any reports of labs done in previous weeks; this encourages students to keep their lab books up to date. Each student should be sampled the same number of times throughout the module with a designated number contributing to the assessment mark.	**Summative**
Multiple choice questions (MCQs)	Written	Can be useful for diagnostic, formative assessment, in addition to summative assessment. Well-designed questions can assess more than factual recall of information, but do take time to design.	**Formative / Summative**
Online discussion boards	Written	Students are assessed on the basis of their contributions to an online discussion for example, with their peers; this could be hosted on a virtual learning environment (VLE).	**Formative**
Open book exams	Written	Students have the opportunity to use any or specified resources to help them answer set questions under time constraints. This method removes the over-reliance on memory and recall and models the way that professionals manage information.	**Summative**
Oral presentations	Oral / Written	Students are asked to give an oral presentation on a particular topic for a specified length of time and could also be asked to prepare associated	**Summative**

		handout(s). Can usefully be combined with self- and peer-assessment.	
Problem sheets	Written	Students complete problem sheets, e.g. on a weekly basis. This can be a useful way of providing students with regular formative feedback on their work and/or involving elements of self- and peer assessment.	**Formative**
Research projects / Group projects	Written/ Practical/ Oral/ Performance/ Problem based/ Work placement	Potential for sampling wide range of practical, analytical and interpretative skills. Can assess wide application of knowledge, understanding and skills.	**Formative / Summative**
Short answer questions	Written	Useful to assess a wide range of knowledge/skills across a module.	**Summative**
Simulations	Practical/ Written/ Oral/ Problem-based	Text or virtual computer-based simulations are provided for students, who are then required to answer questions, resolve problems, perform tasks and take actions etc. according to changing circumstances within the simulation. Useful for assessing a wide range of skills, knowledge and competencies.	**Formative**
Viva voce	Oral	Often used for assessing 'borderline' degree classifications but also useful to explore students' understanding of a wide range of topics. Depending on class size however, they can be time consuming for staff.	**Summative**