CURRICULUM STRUCTURE FOR
FOUNDATION IN SCIENCE AND TECHNOLOGY (AST)
UPDATE: DECEMBER 2024

Semester	Code	Course	Classification	Credit	Total Credit
1	ULE1113	Preparatory English	Common Core	3	15
	UHQ1012	Talent Development	Common Core	2	
	FSM1015	Fundamental Mathematics	Core	5	
	FSP1015	Mechanics Physics	Core	5	
2	ULG1113/ ULM1113	Deutsch 1 **or** Mandarin 1	Common Core	3	18
	FSM1025	Essential Engineering Mathematics	Specialization	5	
	FSP1025	Electromagnetic Physics	Specialization	5	
	FSC1015	General Chemistry 1	Core	5	
3	ULG1123 /ULM1123	Deutsch 2 **or** Mandarin 2	Common Core	3	17
	ULE1122	Intercultural Communication	Common Core	2	
	FSD1012	Basics of Data Science	Specialization	2	
	FSC1025	General Chemistry 2	Core	5	
	FSK1015	ICT Programming and Logic Essentials	Common Core	5	
Total Credit					50

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)	
PEO1	Students will be able to apply basic knowledge in science, technology, engineering and mathematics.
PEO2	Students will be able to do basic practical skills to solve related problems.
PEO3	Students will be able to integrate affective values in life

. **PROGRAMME LEARNING OUTCOMES (PLO)**	
PLO1	Utilize facts to describe and discuss concepts, principles and processes in a specific field of study.
PLO2	Apply fundamental principles in the field of study to identify and solve problems.
PLO3	Conduct academic activities such as collect, analyze, organize and process data/ information to make conclusions individually or in groups.
PLO4	Communicate effectively, orally and in writing.
PLO5	Utilize basic digital technology applications to seek and process data related to a specific field of study.
PLO6	Search, interpret and use relevant information to pursue lifelong learning independently.

COURSE SYNOPSIS

ULE1113
PREPARATORY ENGLISH
The course primarily aims to equip students with enhanced communicative performance in academic settings. They will be exposed to listening and comprehending main points and supporting details on both concrete and abstract topics, particularly related to personal or professional interest when the delivery is clear. Additionally, students will be trained to discuss, offer suggestions to support ideas and evaluate opinions on challenging yet familiar topics. They will also be taught to write clear, straightforward texts. This course is defined within the CEFR high B1 to low B2 level.

UHQ1012
Talent Development
This course focuses on the dynamic and integrated approach required by the industry through coaching and mentoring, change management, critical thinking and problem solving, ethics and morals for professional, communication skills and project closure. In the end, students will be more competent, competitive and prepared to venture the workplace challenges.

ULG1113
Deutsch 1
This course equips students with a foundational level of communicative proficiency in clearly defined, familiar everyday contexts. This course emphasises the four key language skills of speaking, reading, writing, and listening and is defined within the Common European Framework of References for Languages (CEFR) low A1 level.

ULM1113
Mandarin 1
This course aims to enable students to develop basic conversational skills in daily life about topics such as simple expressions in greeting, saying good-bye, expressing gratitude and making apologies, etc. Based on the syllabus of Chinese Proficiency Test, Hanyu Shuiping Kaoshi (HSK) Level 1, the students will learn Chinese Phonetics (Hanyu Pinyin System), 150 vocabulary and several Mandarin grammatical structures. Classroom activities and assessment methods will include listening, speaking, reading and writing. The course is defined within the Common European Framework of References for Languages (CEFR) low-A1 to intermediate A1 or HSK Level 1..

ULG1123
Deutsch 2
This course equips students with a foundational level of communicative proficiency in clearly defined, familiar everyday contexts to some areas of the most immediate personal relevance through the emphasis of the four key language skills namely, speaking, reading, writing, and listening. The course is defined within the Common European Framework of References for Languages (CEFR) intermediate A1 to low A2.

ULM1123
Mandarin 2
This course enables students to develop communication skills in a culturally appropriate manner using phrases and the highest frequency vocabulary in clearly defined, familiar everyday contexts to some areas of the most immediate personal relevance e.g. basic and personal information, personal emotion, culture and working life. Based on the syllabus of Chinese Proficiency Test, Hanyu Shuiping Kaoshi (HSK) Level 2, the students will continue to practice the use of Chinese Phonetics (Hanyu Pinyin System). Students will learn stress of Chinese pronunciation, vocabulary of 300 words and frequently used Mandarin grammatical structures. Classroom activities and assessment methods develop the 4 skills: listening, speaking, reading and writing. The course is defined within the Common European Framework of References for Languages (CEFR) intermediate A1 to low A2 or HSK Level 2.

ULE1122
Intercultural Communication
This course introduces students to the process of communication across cultures with the purpose of improving their ability to interact with others in their personal and professional lives. The course will cover several intercultural and global themes, including educational reform, the impacts of technology and ethics and professionalism, to build students' confidence for improved intrapersonal, interpersonal and intercultural communication. The course will be completed through a combination of reflective writings and oral presentations, namely small talk and debates.

FSM1015
Fundamental Mathematics
This course is designed to develop students' confidence with mathematical concepts and relationships and use of mathematics and techniques in a range of contexts, specifically problem solving and abstract thinking. Topics covered are numbers, functions and polynomials, sequences and series, matrices, trigonometry, vector, limits and differentiation.

FSP1015
MECHANICS PHYSICS
The course covers the foundations of physics in which includes topics on units and measurements; kinematics in one dimension and two dimensions; dynamics; work and energy; linear momentum; circular motion; statics and torques; periodic motion and waves; deformation of solids; heat and thermodynamics.

FSM1025
ESSENTIAL ENGINEERING MATHEMATICS
This course will enable students to study the basic concepts of calculus and statistics. Topics include integrals, application of integration, differential equations, introduction to statistics and probability, random variables and statistical distributions with a strong emphasis on engineering application.

FSP1025
ELECTROMAGNETIC PHYSICS
The course covers the foundations of physics which includes topics on electric charges and forces; electric fields and potential; magnetic fields and forces; electromagnetic induction; direct current; electromagnetic waves; and geometric optics. Through this course, students will engage in hands-on experiments to apply the related theoretical concept

FSC1015
GENERAL CHEMISTRY 1
This course emphasizes basic understanding of chemistry including theories and basic concepts. The basic concepts cover atoms, atomic structure and the periodic table of elements which is often used in engineering, especially chemical and mechanical engineering. The course also focuses on the physical and chemical properties of materials. Properties of matter in gases, liquids and solids will be described. In addition, the reaction rate and the stability of matter in determining the direction of the reaction will be explained. At the end of this course, students will master the theory, concepts and understanding of basic chemistry which can be apply in engineering field.

FSD1012
BASICS OF DATA SCIENCE
Data science is an emerging field of study and requires a powerful combination of various disciplines namely mathematics, statistics, computer science and domain expertise. This course presents the essentials knowledge for data science including the definition, process, applications and issues. It also introduces computer software such as Microsoft Excel or R language for: data manipulation, graphing, simple loops and function and fundamental statistics.

FSC1025
GENERAL CHEMISTRY 2
This course is a continuation of the General Chemistry 1, which include the synthesis and reactions of selected functional groups in the field of organic chemistry. Polymer will be the conclusion of all these functional groups and their application in industry.

FSK1015
ICT PROGRAMMING AND LOGIC ESSENTIALS
This course is designed to provide essential knowledge on ICT and to develop students' problem solving skill through designing and developing computer programs. Topics covered are problem-solving techniques, introduction to structured programming, basic algorithms for searching and sorting, and the modular programming approach.