BACHELOR OF ENGINEERING WITH HONOURS IN

SYSTEMS ENGINEERING (ELECTROMECHANICAL SYSTEMS)

PROGRAMME INFORMATION

The Bachelor of Engineering with Honours in Systems Engineering (ElectroMechanical Systems), also known as SEEMS, is a multidisciplinary degree programme that brings together the fields of mechanical, electrical, electronic, and computer engineering with a holistic approach to system development. Systems engineering focusses on the design, development, implementation, and life-cycle management of complex interconnected systems. The SEEMS programme specifically focusses on the engineering of complex mechanical systems that are controlled by microprocessors and microcontrollers.

Graduates of this programme will understand the larger context of hardware and software engineering, and be able to solve complex problems through an integrated and multidisciplinary approach.

SEEMS is a joint degree programme offered by Singapore Institute of Technology (SIT) and DigiPen Institute of Technology (DigiPen).

ABOUT DIGIPEN INSTITUTE OF TECHNOLOGY (DigiPen)

DigiPen is a dedicated, world-renowned leader in education and research in computer interactive technologies. As a leading institute of higher education, DigiPen is committed to fostering academic growth and inspiring creativity in all its students. As the first school in the world to offer a bachelor's degree in game development, DigiPen has advanced the game industry for more than 25 years by empowering students to become skilled software developers, computer scientists, engineers, designers, and digital artists. Located in Redmond, Washington, U.S.A., with branch campuses in Singapore and Bilbao, Spain, DigiPen offers undergraduate and graduate degrees in disciplines related to video game design and development, hardware and software engineering applied to simulation, computer science, fine arts and digital art production, as well as sound design, and youth programmes. Over the years, DigiPen has won more awards for its student games at the prestigious Independent Games Festival than any other school in the world. Since 2011, 11 out of the 30 total finalists in the IGF China student competition have been games from DigiPen Institute of Technology Singapore, DigiPen (Singapore). Graduates of DigiPen (Singapore) have gone on to work on ground-breaking game franchises, such as Bungie's Destiny and have joined some of the top game and animation studios in Singapore — including Ubisoft, Lucasfilm, Koei Tecmo, and more.

YEAR 1

TRIMESTER 1	1. Computer Environment
	2. Calculus and Analytic Geometry 1
	3. Computer Aided Design
	4. Engineering Fabrication
	5. C Programming
	6. Composition
TRIMESTER 2	1. Systems Engineering Project 1
	2. Calculus and Analytic Geometry 2
	3. Digital Electronics 1
	4. C++ Programming
	5. Systems and Software Engineering
	6. Interpersonal and Work Communication
TRIMESTER 3	Break

YEAR 2

TRIMESTER 1
1. Systems Engineering Project 2
2. Calculus and Analytic Geometry 3
3. Motion Dynamics
4. Digital Electronics 2
5. Systems and Project Management

TRIMESTER 2
1. Systems Engineering Project 3
2. Waves, Optics and Thermodynamics
3. Electric Circuits
4. ElectroMechanical Design
5. Requirement Engineering and Systems Architecture
6. Career Planning and Development

TRIMESTER 3 **Overseas Immersion Programme (OIP)**
1. Linear Algebra
2. Differential Equations
3. Electricity and Magnetism
4. Embedded Systems Design
5. Advanced C/C^{++}

YEAR 3

TRIMESTER 1 Integrated Work Study Programme (IWSP)
1. The Engineer and Society

TRIMESTER 2 Integrated Work Study Programme (IWSP)

TRIMESTER 3 Integrated Work Study Programme (IWSP)/Break

YEAR 4

TRIMESTER 1
1. Capstone Project 1
2. Discrete Mathematics
3. Control Systems 1
4. Data Structures
5. Systems Design and Analysis
6. Systems Modeling and Simulation

TRIMESTER 2
1. Capstone Project 2
2. Control Systems 2 / Robotics
3. Risk and Decision Analysis
4. Systems Integration, Verification and Validation
5. Large Scale Systems

TRIMESTER 3 GRADUATE

Note: this curriculum is regularly updated with industry input.

PROGRAMME HIGHLIGHTS

Traditional approaches to engineering education focus individually on the different sub-disciplines of mechanical, electrical, electronic or computer engineering. Systems engineering transcends these boundaries and looks at integrating systems from diverse disciplines to produce functionality not achieved by a single discipline. Systems engineering enables the development, analysis and management of multidisciplinary systems with a broad range of applications. Its methodologies address industry complexities such as uncertainty, constraints, multiple objectives, and interactions among various parts or subsystems that constitute the whole. Trained systems engineers use sophisticated methods to develop and effectively manage engineered systems in today's complex and interconnected world.

INTEGRATED WORK STUDY PROGRAMME (IWSP)

IWSP provides students with the opportunity to apply their studies in a professional environment. The duration of IWSP for this programme is eight months to a year. In addition to building new technical competencies, students will also gain invaluable experience working alongside professionals in the fields of their study.

OVERSEAS IMMERSION PROGRAMME (OIP)

The Overseas Immersion Programme (OIP) is mandatory for SEEMS students. Students will spend one trimester at the DigiPen US campus, and attend lectures, labs, and industry seminars. Students will interact with American professors and mentors while experiencing life in a different culture.

ADMISSION REQUIREMENTS

Diploma holders from any of the five local polytechnics and A-Level graduates are welcome to apply. Applicants must complete the application forms online and send in a Personal Statement through the SIT admission portal at SingaporeTech.edu.sg. Original or notarised copies of all educational records or transcripts must be submitted.

EXEMPTIONS

Applicants may be granted exemptions from individual modules on a case-by-case basis, depending on the content of previous modules completed and grades earned.

CAREER OPPORTUNITIES

Career opportunities in systems engineering are driven by increasing globalisation and technological advancements. As Singapore and the world continue to develop more interconnected devices and systems, the need for engineers with both component- and system-level knowledge will increase dramatically.

SEEMS graduates will be uniquely prepared to address these increasingly complex system design and development tasks. Potential entry-level positions for new SEEMS graduates include: Systems Engineer, Design Engineer, Quality Control Engineer, Project Engineer, Software Engineer, Software Analyst, Embedded Systems Engineer and ElectroMechanical Engineer. Graduates of this degree programme will have the knowledge and skills to pursue careers in industries such as transport, marine, defence and precision engineering.

PROGRAMME ADVISORY COMMITTEE

The Industry Advisory Committee members for this programme are:

Mr Sudesh K KRISHNAMOORTHY
Rational Brand Architect
IBM Software
ASEAN IBM

Mr Simon KUIK Sow Hong
Vice President / Head
Research and Development
Sembcorp Marine Ltd

Mr OH Sin Hin
Senior Manager
Systems Assurance and Integration Division
Land Transport Authority

ME6 TOH Tee Yang
Head Logistics Organisational Planning Branch
Operational Logistics Group
Republic of Singapore Navy

Dr TOK Eng Soon
Department of Physics
National University of Singapore

Dr Victor WONG
Head, Facilities Management Biopolis
Agency for Science Technology and Research