

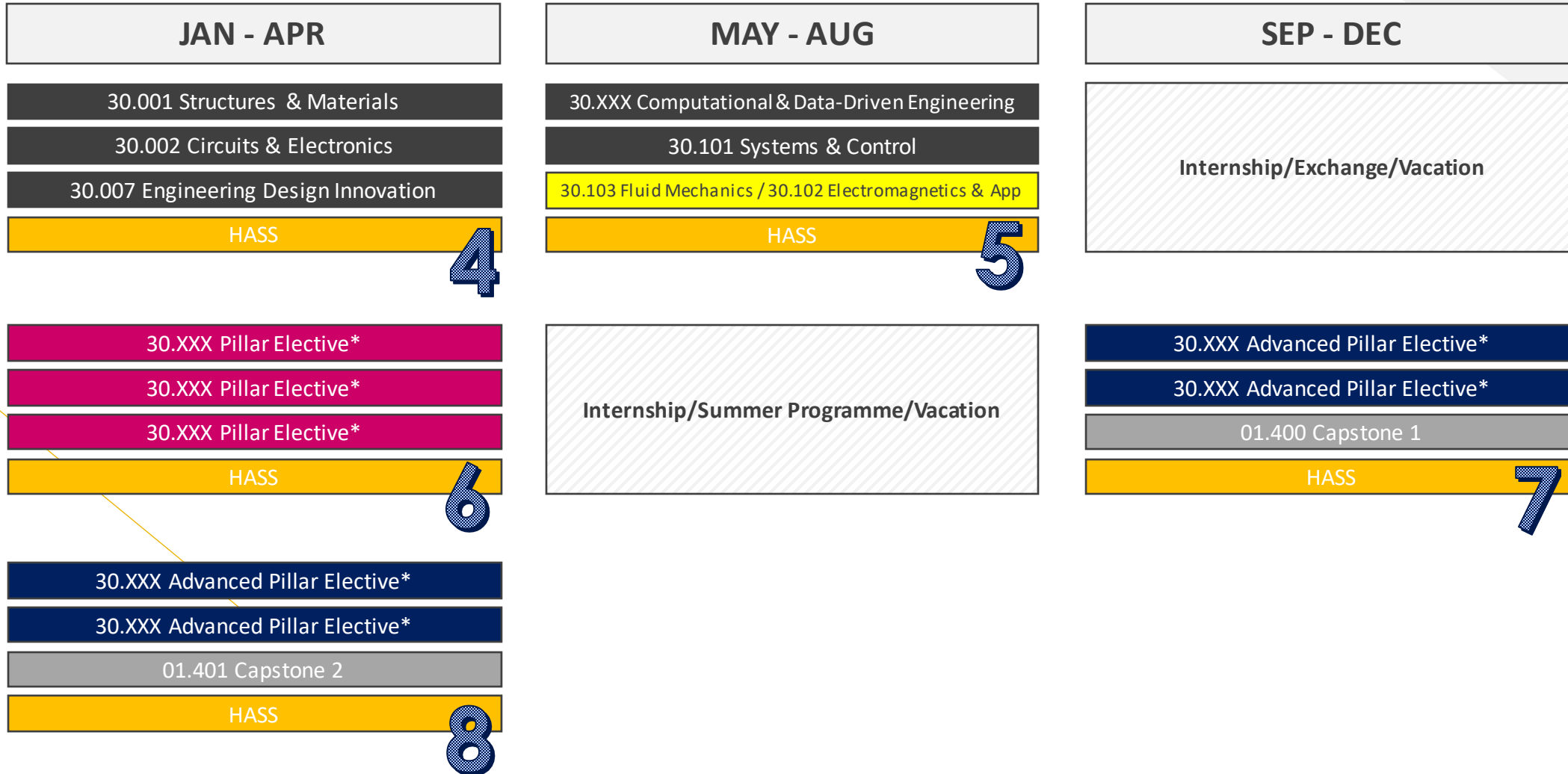
EPD

CURRICULUM

SUTD UNDERGRADUATE ACADEMIC CALENDAR (from AY2020 onwards)

YEAR	JAN - APR	MAY - AUG	SEP - DEC
			Freshmore TERM 1
Y1	Freshmore TERM 2	Vacation/ Summer Programme	Freshmore TERM 3
Y2	Sophomore TERM 4	Junior TERM 5	Vacation/Exchange/ Internship
Y3	Junior • Internship/Exchange [^] TERM 6	Vacation/Internship/ Summer Programme	Senior • Capstone TERM 7
Y4	Senior • Capstone TERM 8		

Undergraduate EPD Curriculum



- PILLAR CORE
- PILLAR ELECTIVE
- ADVANCED PILLAR ELECTIVE
- RESTRICTED PILLAR ELECTIVE
- RESTRICTED TRACK ELECTIVE
- CROSS PILLAR ELECTIVE
- ADVANCED CROSS PILLAR ELECTIVE
- CAPSTONE
- HASS

* Can replace up to 3 Pillar / Advanced Pillar Electives with Unrestricted (XX.XXX) / Technical (01.XXX) Electives. (Exceptions apply to ME and EE Tracks)

List of Electives

• Pillar Electives (Term 6)

30.XXX Pillar Elective*

- 30.104 Dynamics
- 30.105 Machine Element Design
- 30.106 Microelectronics Circuits & Devices
- 30.107 Power Electronics
- 30.108 Material Science
- 30.109 Thermal Systems for Power & Environment
- 30.110 Digital Systems Laboratory
- 30.111 Entrepreneurship
- 30.203 Topics in Biomedical and Healthcare Engineering
- 30.316 Digital Biomimetics: Sustainable Materials and Manufacturing

• Technical Electives (01.XXX)

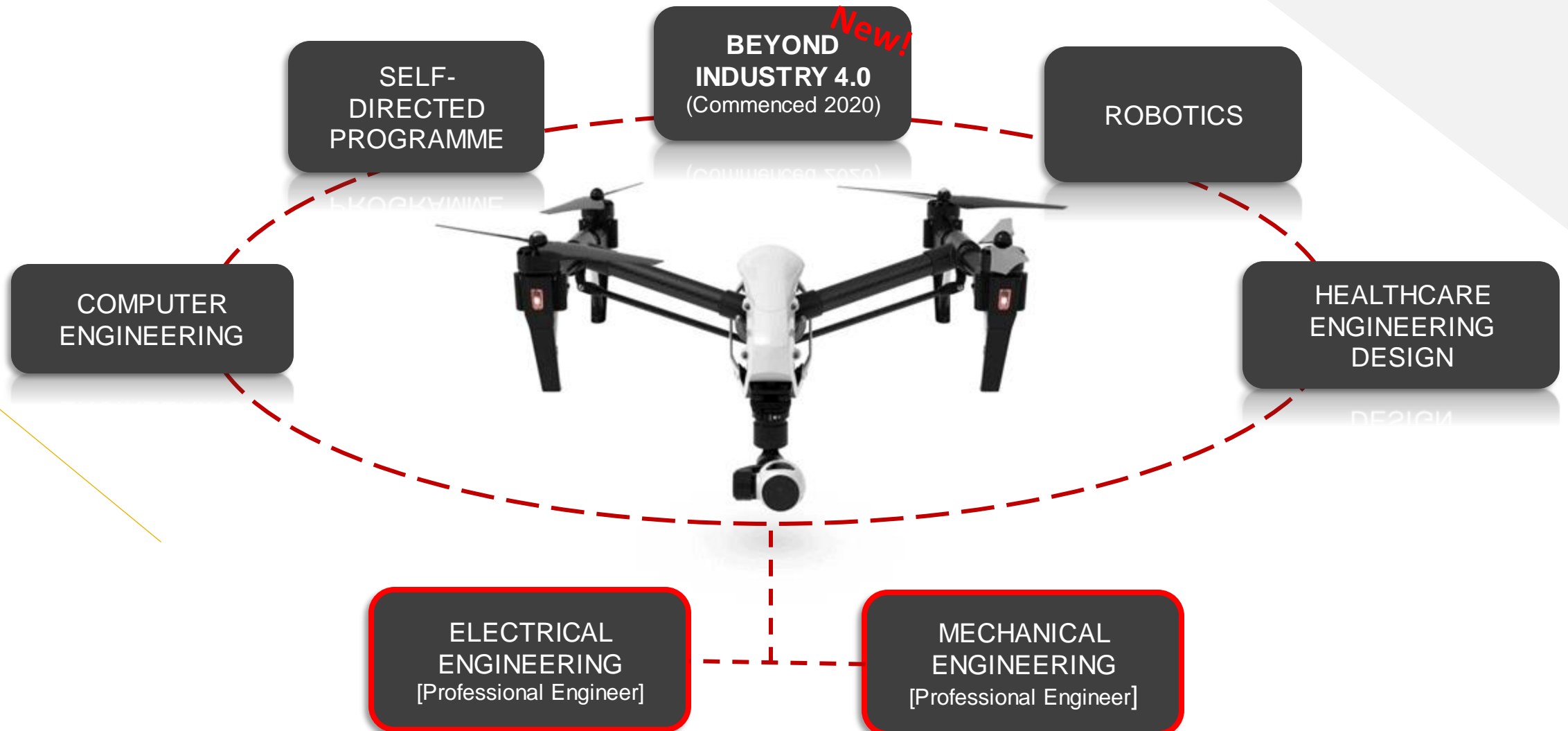
- 01.101 Global Health Technologies
- 01.102 Energy Systems & Management
- 01.104 Networked Life
- 01.106 Engineering Management
- 01.107 Urban Transportation
- 01.110 Computational Fabrication
- 01.111 Culture Formation and Innovative Product Design
- 01.102 Energy Systems and Management
- 01.116 AI for Healthcare
- 01.112 Machine Learning (50.007 Machine Learning)

• Advanced Pillar Electives (Term 7 & 8)

30.XXX Advanced Pillar Elective*

- 30.113 Design & Fabrication of Microelectromechanical Systems (MEMS)
- 30.114 Advanced Feedback & Control
- 30.115 Digital Signal Processing
- 30.117 Electric Power Systems Analysis & Design
- 30.118 Optical Engineering & Communications
- 30.119 Intelligent Robotics
- 30.120 Design & Manufacturing
- 30.123 Healthcare Product Design
- 30.124 Nanoelectronics and Technology
- 30.200 Micro-Nano Projects Laboratory
- 30.201 Wireless Communications and Internet of Things (IoT)
- 30.202 Design of Intelligent Digital Integrated Circuits & Systems
- 30.207 Structural Mechanics and Design
- 30.303 Industry 4.0 and 3D Printing

7 Tracks of EPD



Self-Directed (SD) Track

JAN - APR

30.001 Structures & Materials

30.002 Circuits & Electronics

30.007 Engineering Design Innovation

HASS

4

(30.XXX)*

(30.XXX)*

(30.XXX)*

HASS

6

(30.XXX)*

(30.XXX)*

01.401 Capstone 2

HASS

8

MAY - AUG

30.XXX Computational & Data-Driven Engineering

30.101 Systems & Control

30.103 Fluid Mechanics / 30.102 Electromagnetics & App

HASS

5

Internship/Summer Programme/Vacation

SEP - DEC

Internship/Exchange/Vacation










(30.XXX)*

(30.XXX)*

01.400 Capstone 1

HASS

7

-  PILLAR CORE
-  PILLAR ELECTIVE
-  ADVANCED PILLAR ELECTIVE
-  RESTRICTED PILLAR ELECTIVE
-  RESTRICTED TRACK ELECTIVE
-  CROSS PILLAR ELECTIVE
-  ADVANCED CROSS PILLAR ELECTIVE
-  CAPSTONE
-  HASS

* Can replace up to 3 Pillar / Advanced Pillar Electives with Unrestricted (XX.XXX) / Technical (01.XXX) Electives.

Robotics (RB) Track

JAN - APR

30.001 Structures & Materials

30.002 Circuits & Electronics

30.007 Engineering Design Innovation

HASS

4

(30.104/30.105/30.110/30.111/30.203/30.316)*

(30.104/30.105/30.110/30.111/30.203/30.316)*

(30.104/30.105/30.110/30.111/30.203/30.316)*

HASS

6

(30.115/30.117/30.118/30.201)*

(30.115/30.117/30.118/30.201)*

01.401 Capstone 2

HASS

8

MAY - AUG

30.XXX Computational & Data-Driven Engineering

30.101 Systems & Control

30.103 Fluid Mechanics / 30.102 Electromagnetics & App

HASS

5

Internship/Summer Programme/Vacation

SEP - DEC

Internship/Exchange/Vacation










30.119 Intelligent Robotics

(30.114/30.120/30.123/30.207)*

01.400 Capstone 1

HASS

7

-  PILLAR CORE
-  PILLAR ELECTIVE
-  ADVANCED PILLAR ELECTIVE
-  RESTRICTED PILLAR ELECTIVE
-  RESTRICTED TRACK ELECTIVE
-  CROSS PILLAR ELECTIVE
-  ADVANCED CROSS PILLAR ELECTIVE
-  CAPSTONE
-  HASS

* Can replace up to 3 Pillar / Advanced Pillar Electives with Unrestricted (XX.XXX) / Technical (01.XXX) Electives.

Computer Engineering (CE) Track

JAN - APR

30.001 Structures & Materials

30.002 Circuits & Electronics

30.007 Engineering Design Innovation

HASS

4

30.110 Digital Systems Lab

(30.106/30.107/30.111/30.203/30.316)* (50.001/50.002/50.004/50.007)*

(30.106/30.107/30.111/30.203/30.316)* (50.001/50.002/50.004/50.007)*

HASS

6

(30.115/30.124/30.201)* (50.021/50.033)*

(30.115/30.124/30.201)* (50.021/50.033)*

01.401 Capstone 2

HASS

8

MAY - AUG

30.XXX Computational & Data-Driven Engineering

30.101 Systems & Control

30.102 Electromagnetics & App

HASS

5

Internship/Summer Programme/Vacation

SEP - DEC

Internship/Exchange/Vacation

(30.123/30.202)* (50.003/50.005/50.006/50.017/50.020/50.035)*

(30.123/30.202)* (50.003/50.005/50.006/50.017/50.020/50.035)*

01.400 Capstone 1

HASS

7

Cross Pillar Electives

- 50.001 Introduction to ISTD
- 50.002 Computation Structures
- 50.003 Elements of Software Construction
- 50.004 Introduction to Algorithms
- 50.005 Computer System Engineering
- 50.006 User Interface Design and Implementation
- 50.007 Machine Learning
- 50.017 Graphics & Visualization
- 50.020 Network Security
- 50.021 Artificial Intelligence
- 50.033 Foundations of Game Design & Development
- 50.035 Computer Vision

- PILLAR CORE
- PILLAR ELECTIVE
- ADVANCED PILLAR ELECTIVE
- RESTRICTED PILLAR ELECTIVE
- RESTRICTED TRACK ELECTIVE
- CROSS PILLAR ELECTIVE
- ADVANCED CROSS PILLAR ELECTIVE
- CAPSTONE
- HASS

* Can replace up to 3 Pillar / Advanced Pillar Electives with Unrestricted (XX.XXX) / Technical (01.XXX) Electives.

Healthcare Engineering Design (HED) Track

JAN - APR

30.001 Structures & Materials
 30.002 Circuits & Electronics
 30.007 Engineering Design Innovation
 HASS

4

30.203 Topics in Biomedical & Healthcare Eng
 (30.104/30.105/30.106/30.107/30.108/30.109/
 30.110/30.111/30.316)*
 (30.104/30.105/30.106/30.107/30.108/30.109/
 30.110/30.111/30.316)*
 HASS

6

(30.113/30.115/30.118/30.200/30.201)*
 (30.113/30.115/30.118/30.200/30.201)*
 01.401 Capstone 2
 HASS

8

MAY - AUG

30.XXX Computational & Data-Driven Engineering
 30.101 Systems & Control
 30.103 Fluid Mechanics / 30.102 Electromagnetics & App
 HASS

5










Internship/Summer Programme/Vacation

SEP - DEC

Internship/Exchange/Vacation

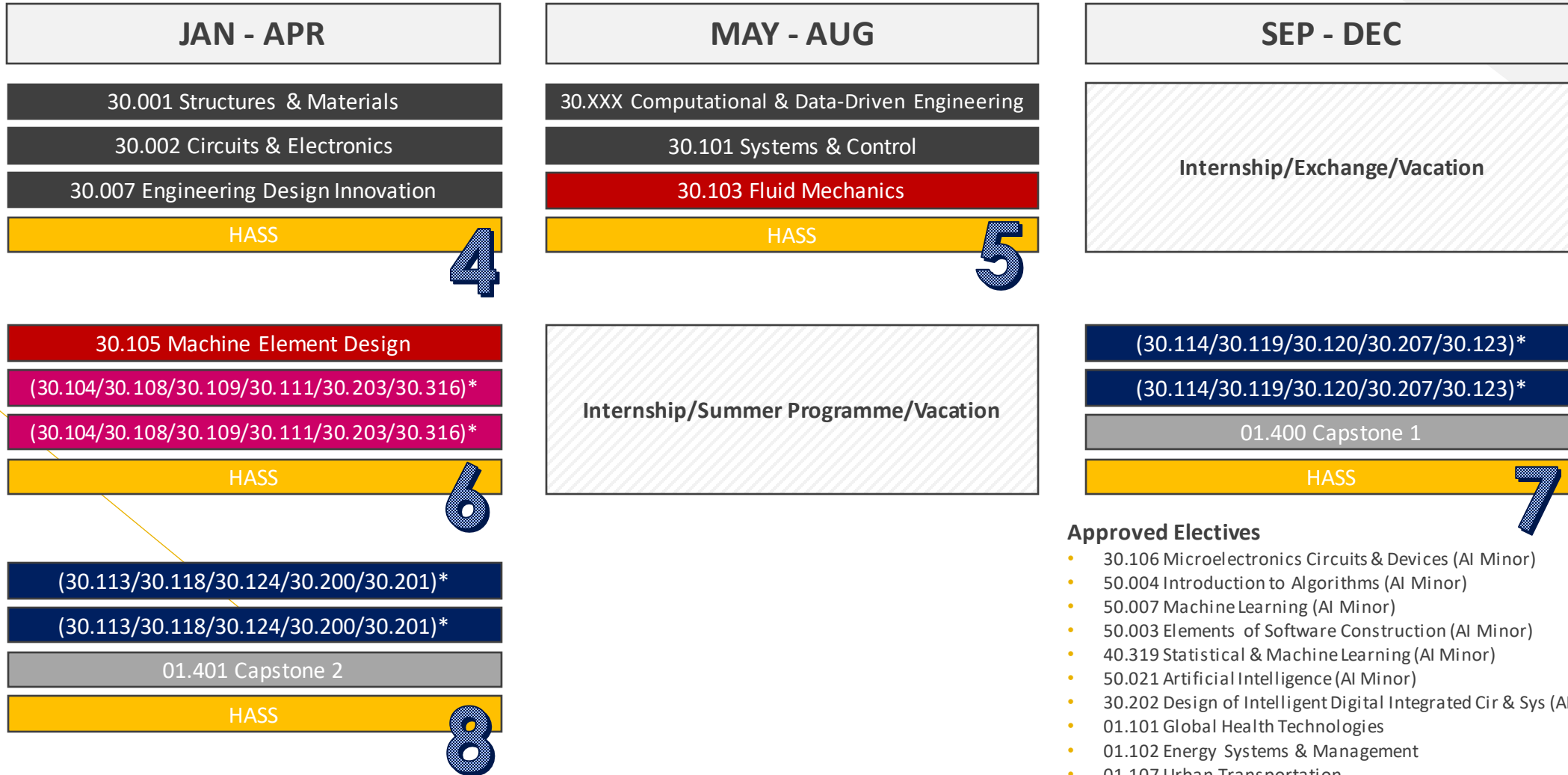
30.123 Healthcare Product Design
 (30.114/30.119/30.120)*
 01.400 Capstone 1
 HASS

7

-  PILLAR CORE
-  PILLAR ELECTIVE
-  ADVANCED PILLAR ELECTIVE
-  RESTRICTED PILLAR ELECTIVE
-  RESTRICTED TRACK ELECTIVE
-  CROSS PILLAR ELECTIVE
-  ADVANCED CROSS PILLAR ELECTIVE
-  CAPSTONE
-  HASS

* Can replace up to 3 Pillar / Advanced Pillar Electives with Unrestricted (XX.XXX) / Technical (01.XXX) Electives.

Mechanical Engineering (ME) Track



- PILLAR CORE
- PILLAR ELECTIVE
- ADVANCED PILLAR ELECTIVE
- RESTRICTED PILLAR ELECTIVE
- RESTRICTED TRACK ELECTIVE
- CROSS PILLAR ELECTIVE
- ADVANCED CROSS PILLAR ELECTIVE
- CAPSTONE
- HASS

- Approved Electives**
- 30.106 Microelectronics Circuits & Devices (AI Minor)
 - 50.004 Introduction to Algorithms (AI Minor)
 - 50.007 Machine Learning (AI Minor)
 - 50.003 Elements of Software Construction (AI Minor)
 - 40.319 Statistical & Machine Learning (AI Minor)
 - 50.021 Artificial Intelligence (AI Minor)
 - 30.202 Design of Intelligent Digital Integrated Cir & Sys (AI Minor)
 - 01.101 Global Health Technologies
 - 01.102 Energy Systems & Management
 - 01.107 Urban Transportation
 - 01.106 Engineering Management
 - 01.110 Computational Fabrication

* Can replace up to 3 Pillar / Advanced Pillar Electives with PEB Approved Electives.

Electrical Engineering (EE) Track

JAN - APR

30.001 Structures & Materials
 30.002 Circuits & Electronics
 30.007 Engineering Design Innovation
 HASS

4

30.107 Power Electronics
 (30.106/30.108/30.109/30.110/
 30.111/30.203/30.316)*
 (30.106/30.108/30.109/30.110/
 30.111/30.203/30.316)*
 HASS

6

30.117 Electric Power Systems Analysis & Design
 (30.113/30.115/30.118/30.124/30.201)*
 01.401 Capstone 2
 HASS

8

MAY - AUG

30.XXX Computational & Data-Driven Engineering
 30.101 Systems & Control
 30.102 Electromagnetics & App
 HASS

5

Internship/Summer Programme/Vacation

SEP - DEC






Internship/Exchange/Vacation

(30.114/30.119/30.202/30.123)*
 (30.114/30.119/30.202/30.123)*
 01.400 Capstone 1
 HASS

7

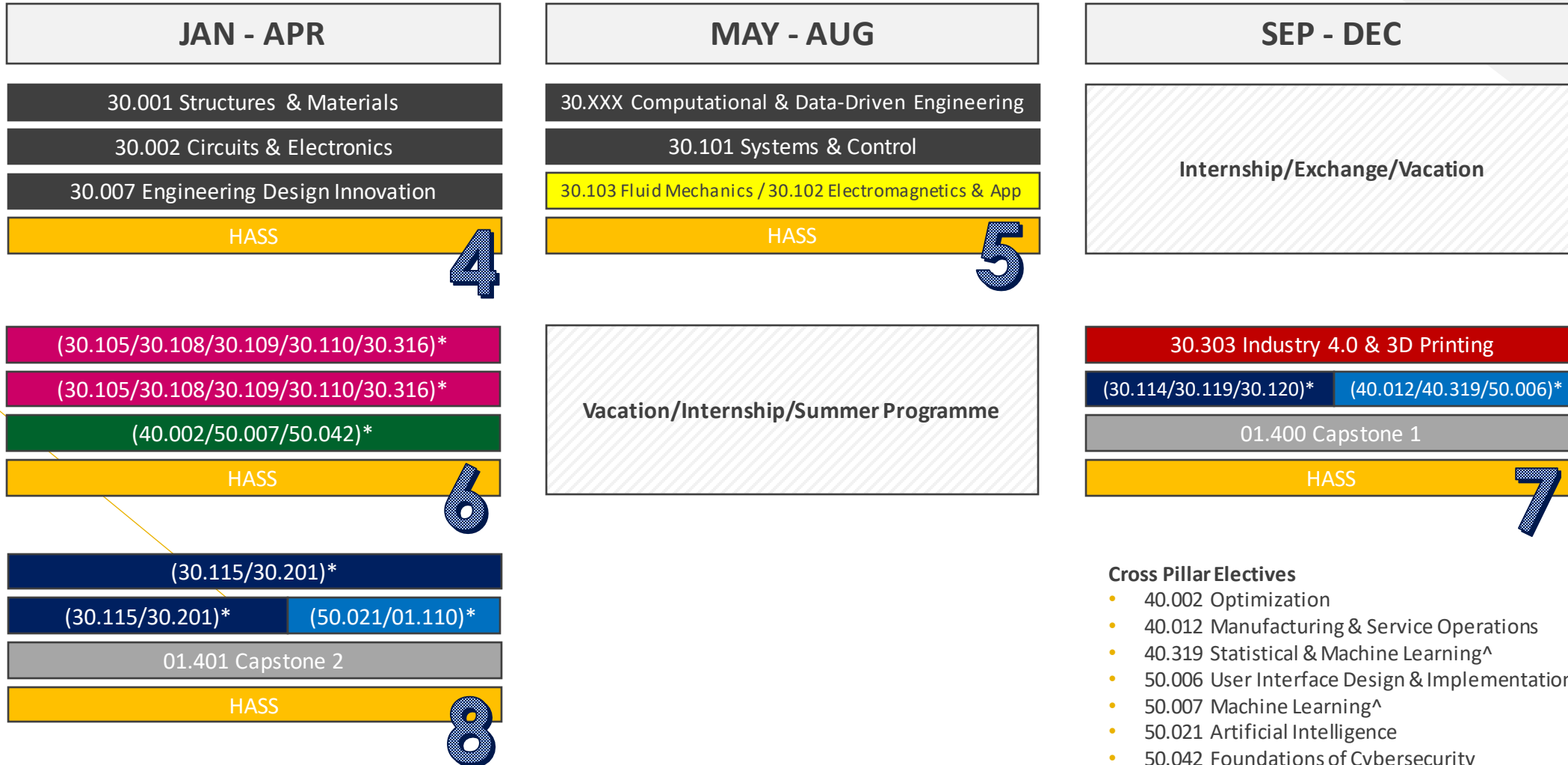
Approved Electives

- 50.004 Introduction to Algorithms (AI Minor)
- 50.007 Machine Learning (AI Minor)
- 50.003 Elements of Software Construction (AI Minor)
- 40.319 Statistical & Machine Learning (AI Minor)
- 50.021 Artificial Intelligence (AI Minor)
- 01.101 Global Health Technologies
- 01.102 Energy Systems & Management
- 01.107 Urban Transportation
- 01.106 Engineering Management
- 01.110 Computational Fabrication
- 30.120 Design & Manufacturing

-  PILLAR CORE
-  PILLAR ELECTIVE
-  ADVANCED PILLAR ELECTIVE
-  RESTRICTED PILLAR ELECTIVE
-  RESTRICTED TRACK ELECTIVE
-  CROSS PILLAR ELECTIVE
-  ADVANCED CROSS PILLAR ELECTIVE
-  CAPSTONE
-  HASS

* Can replace up to 3 Pillar / Advanced Pillar Electives with PEB Approved Electives.

Beyond Industry 4.0 (BI4) Track

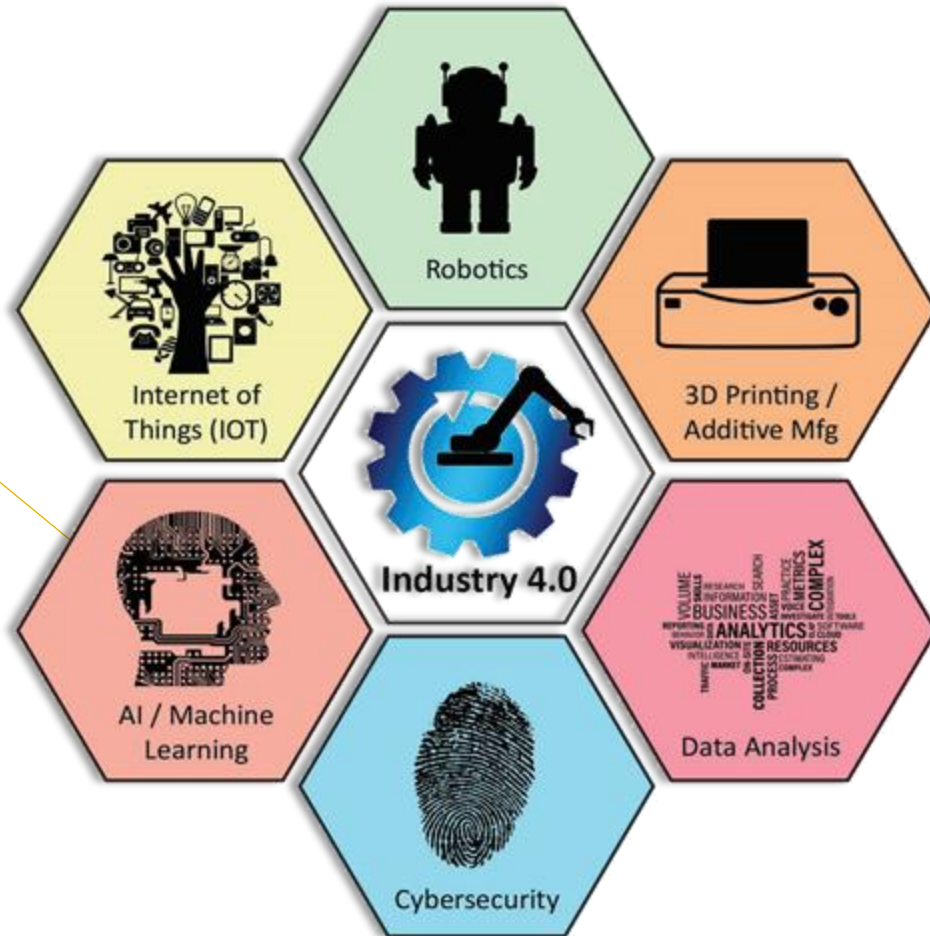


- PILLAR CORE
- PILLAR ELECTIVE
- ADVANCED PILLAR ELECTIVE
- RESTRICTED PILLAR ELECTIVE
- RESTRICTED TRACK ELECTIVE
- CROSS PILLAR ELECTIVE
- ADVANCED CROSS PILLAR ELECTIVE
- CAPSTONE
- HASS

- Cross Pillar Electives**
- 40.002 Optimization
 - 40.012 Manufacturing & Service Operations
 - 40.319 Statistical & Machine Learning[^]
 - 50.006 User Interface Design & Implementation
 - 50.007 Machine Learning[^]
 - 50.021 Artificial Intelligence
 - 50.042 Foundations of Cybersecurity

* Can replace up to 3 Pillar / Advanced Pillar Electives with Unrestricted (XX.XXX) / Technical (01.XXX) Electives.
[^] Cannot take both 40.319 Statistical and Machine Learning and 50.007 Machine Learning.

New Track: Beyond Industry 4.0



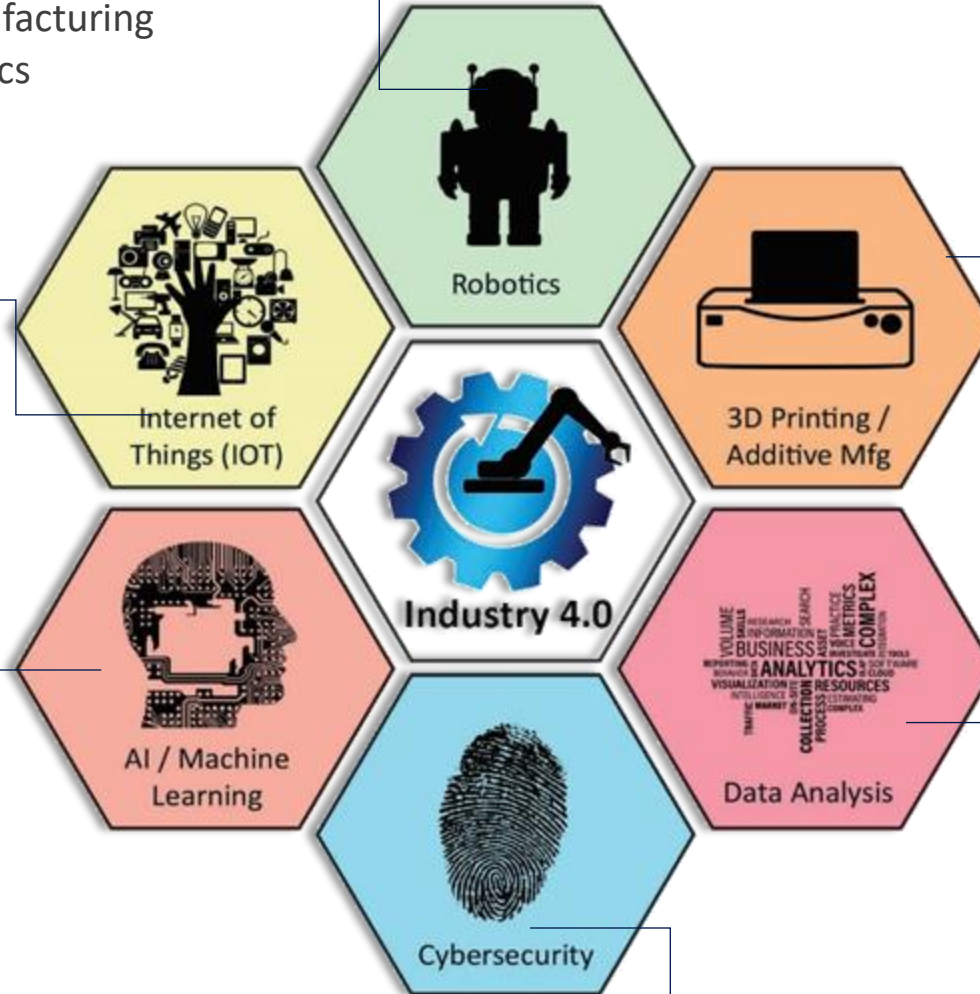
Industry 4.0 is an approach to **combining traditional manufacturing processes and emerging technology**, to improve automation, communication and use of real-time data. It combines several major innovations in digital technology that are transforming the manufacturing sectors. From advanced robotics, artificial intelligence and machine learning to software-as-a-service and the Industrial Internet of Things, these combined technologies enable a powerful new way of organising global operations.

Upon successful completion, students in the Industry 4.0 track will find career opportunities in industries including aerospace, biomedical technology, clean and renewable energy, consumer products, materials research, medical device and healthcare development, microelectronics manufacturing, pharmaceutical manufacturing, water treatment and many others.

30.105 Machine Element Design
30.109 Thermal Systems
30.114 Advanced Feedback & Control
30.119 Intelligent Robotics
30.120 Design and Manufacturing
30.316 Digital Biomimetics

30.105 Machine Element Design
30.108 Materials Science
30.109 Thermal Systems
30.119 Intelligent Robotics
30.316 Digital Biomimetics
30.303 Industry 4.0 & 3D Printing

30.110 Digital Systems Lab
30.120 Design & Manufacturing
40.012 Manufacturing and Service Operations



30.115 Digital Signal Processing
40.002 Optimisation
40.012 Manufacturing & Service Operations
40.319 Statistical & Machine Learning
50.006 User Interface Design & Implementation

50.007 Machine Learning
40.319 Statistical & Machine Learning
50.021 Artificial Intelligence

50.042 Foundations of Cybersecurity

SUTD Minor Programmes

- All minor programmes consists of a collection of (at least) **5 subjects** required by the department offering the minor, 2 of which may be cross-listed as meeting the major requirements while the remaining 3 may be taken as technical electives.
- Design, Innovation, Ventures & Entrepreneurship (**DIVE**) Minor (EPD)
- Artificial Intelligence (**AI**) Minor (ISTD)
- Computer Science (**CS**) Minor (ISTD)
- Engineering Systems (**ES**) Minor (ESD)
- Healthcare Informatics (**IS**) Minor (SMT)
- Design, Technology & Society (**DTS**) Minor (HASS)
- Digital Humanities (**DH**) Minor

Design, Innovation, Ventures & Entrepreneurship (DIVE) Minor

- Required 4 core courses:
 - 30.007 Engineering Design Innovation
 - 30.111 Entrepreneurship
 - 01.400 Entrepreneurship Capstone
 - 01.401 Entrepreneurship Capstone
- Choose 1 remaining elective from:
 - 01.106 Engineering Management
 - 02.228 Design in the Anthropocene
 - 02.226 Leaders and Followers
 - 02.140TS Shaping Futures: Innovation, Work and Society
 - 02.223 Morals and Markets (Business Ethics)
 - 02.208 Microeconomics
 - 02.229 Decision Theory and Practice
 - 02.202 Organizational Process
 - 02.133 Ideal Innovations: Science Fiction and the Ethics of Technology

Artificial Intelligence (AI) Minor

- Required 3 core courses:
 - 50.003 Elements of Software Construction/ 50.004 Introduction to Algorithms
 - 50.007 Machine Learning / 40.319 Statistical and Machine Learning
 - 50.021 Artificial intelligence
- Choose 2 remaining electives from:
 - 01.116 AI for Healthcare
 - 50.006 User Interface Implementation and Design
 - 50.017 Graphics and Visualisation
 - 50.020 Network Security
 - 50.035 Computer Vision
 - 50.037 Blockchain Technology
 - 50.038 Computational Data Science
 - 50.039 Theory and Practice of Deep Learning
 - 50.040 Natural Language Processing
 - 50.043 Database and Big Data Systems
 - 50.044 System Security
 - **30.202 Digital Integrated Circuit Design**
 - **30.119 Intelligent Robotics**
 - **30.106 Microelectronics Circuits and Devices**
 - 40.002 Optimisation
 - 40.016 The Analytics Edge

Computer Science (CS) Minor

- Required 3 courses:
 - **1 CSD Core subject (50.001, 50.002, 50.003, 50.004, 50.005, 50.034)**
 - Any 2 CSD (50.XXX) courses with an equivalent of 24 subject credits
- Choose 2 remaining electives from:
 - 30.101 Systems and Control
 - 30.110 Digital Systems Laboratory
 - 30.115 Digital Signal Processing
 - 30.119 Intelligent Robotics
 - 30.201 Wireless Communications & IoT

Detailed list of CSD Core:

- 50.001 Information Systems & Programming
- 50.002 Computation Structures
- 50.003 Elements of Software Construction
- 50.004 Algorithms
- 50.005 Computer System Engineering
- 50.034 Probability and Statistics

Engineering Systems (ES) Minor

- Required courses:
 - 10.022 Modelling Uncertainty (Freshmore core)
 - 40.002 Optimisation or 40.017 Probability and Statistics
- Choose 2 ESD electives from:
 - 40.012 Manufacturing and Service Operations
 - 40.014 Engineering Systems Architecture
 - 40.316 Game Theory
 - 40.015 Simulation Modelling and Analysis
 - 40.002 Optimisation
 - 40.017 Probability and Statistics
 - 40.319 Statistical and Machine Learning
 - 40.XXX Airport Systems
 - 01.107 Urban Transportation
- Choose remaining 2 electives from:
 - 50.021 Artificial Intelligence
 - 50.038 Computational Data Science
 - **30.114 Advanced Feedback and Control**
 - **30.115 Digital Signal Processing**
 - **30.123 Healthcare Product Design**
 - **30.117 Electric Power Systems Analysis and Design**
 - **30.201 Wireless Communications**
 - **30.111 Entrepreneurship**
 - 50.007 Machine Learning

Healthcare Informatics (HI) Minor

- Required 4 core courses:
 - 02.230TS Health Communication and Behaviour Change
 - 01.116 AI for Healthcare
 - 01.101 Global Health Technologies / 01.114 Instructional Design of Serious Games for Healthcare
 - 50.007 Machine Learning / 40.319 Statistical and Machine Learning / 60.001 Applied Machine Learning
- Choose 1 electives from:
 - **30.203 Topics in Biomedical & Healthcare Engineering**
 - 40.015 Simulation Modelling and Analysis
 - 40.016 The Analytics Edge
 - 50.043 Database and Big Data

Design, Technology & Society (DTS) Minor

- Required 2 core courses:
 - 02.003 Theorizing Society, the Self, and Culture
 - 02.147TS Interventions in Design, Technology, and Society (Core)
- Choose 4 remaining electives from:
 - 02.XXXTS
 - 02.XXXHT

Digital Humanities (DH) Minor

- Required 2 core courses:
 - 02.001 World Texts and Interpretations
 - 02.137**DH** Introduction to Digital Humanities: Principles and Methods (Core)
- Choose 4 remaining electives from:
 - 02.XXX**DH**
 - 02.XXX**HT**

EPD & DAI

30.001 Structures & Materials

30.002 Circuits & Electronics

30.007 Engineering Design Innovation

HASS **4**

30.XXX Pillar Elective*

30.XXX Pillar Elective*

30.XXX Pillar Elective*

HASS **6**

30.XXX Advanced Pillar Elective*

30.XXX Advanced Pillar Elective*

01.401 Capstone 2

HASS **8**

30.XXX Computational & Data-Driven Engineering

30.101 Systems & Control

30.103 Fluid Mechanics / 30.102 Electromagnetics & App

HASS **5**

30.XXX Advanced Pillar Elective*

30.XXX Advanced Pillar Elective*

01.400 Capstone 1

HASS **7**

Algorithms

AI Applications in Design

Product Design Studio

HASS **4**

Applied Deep Learning

Elective

Systems Design Studio

HASS **6**

Elective

Elective

01.401 Capstone 2

HASS **8**

Machine Learning

HCI & Design

Service Design Studio

HASS **5**

Spatial Design Studio

Elective

01.400 Capstone 1

HASS **7**

EPD CE Track & ISTD

	Artificial Intelligence Track	Data Analytics Track	Financial Technology Track	IoT and Intelligent Systems Track	Security Track	Visual Analytics and Computing Track
4	50.001 Information Systems & Programming					
	50.002 Computation Structures					
	50.004 Algorithms					
	HASS					
5	50.003 Elements of Software Construction					
	50.005 Computer System Engineering					
	50.034 Introduction to Probability & Statistics					
	HASS					
6	50.007 Machine Learning OR 40.319 Statistical Machine Learning (Term 7)	50.007 Machine Learning OR 40.319 Statistical Machine Learning (Term 7)	50.007 Machine Learning OR 40.319 Statistical Machine Learning (Term 7)	50.012 Networks OR 50.046 Cloud Computing and IoT (Term 7)	50.042 Foundations of Cybersecurity	Track Elective
	Track Elective	50.038 Computational Data Science	50.043 Database Systems	Track Elective	Track Elective	Track Elective
	Track Elective	50.043 Database Systems	40.324 Fundamentals of Investing [ESD]	Track Elective	Track Elective	Track Elective
	HASS	HASS	HASS	HASS	HASS	HASS
7	50.039 Theory & Practice of Deep Learning	Track Elective	Track Elective	50.046 Cloud Computing and IoT OR 50.012 Networks (Term 6)	50.020 Network Security	50.035 Computer Vision OR 50.039 Theory & Practice of Deep Learning
	Track Elective	Track Elective	Track Elective	50.041 Distributed Systems and Computing	Track Elective	50.008 User Interface Design & Implementation
	Capstone	Capstone	Capstone	Capstone	Capstone	Capstone
	HASS	HASS	HASS	HASS	HASS	HASS
8	50.021 Artificial Intelligence	Track Elective	Track Elective	50.021 Artificial Intelligence	50.044 System Security	50.017 Graphics and Visualisation
	Track Elective	Track Elective	Track Elective	Track Elective	Track Elective	Track Elective
	Capstone	Capstone	Capstone	Capstone	Capstone	Capstone
	HASS	HASS	HASS	HASS	HASS	HASS

Professional Engineer (PEB)

- PEB registers Professional Engineers in:
 - Civil Engineering (Not available in SUTD)
 - Electrical Engineering (EPD EE Track)
 - Mechanical Engineering (EPD ME Track)
- Requirement for application:
 - Holds a valid degree (and track in SUTD)
 - Pass written/oral examinations in:
 - Fundamentals of Engineering Examination (FEE)
 - Practice of Professional Engineering Examination (PPE)
 - At least 4 years of practical experience
 - Good character & reputation
 - Able to carry out duties of a PE effectively
- Around 5k PE registered in Singapore.

