



# JPT

JABATAN  
PENDIDIKAN  
TINGGI

## **TAKLIMAT KURIKULUM TERSEDIA MASA HADAPAN**

HOTEL BANGI PUTRAJAYA  
6 DISEMBER 2018, KHAMIS

## **ELEMENT 1 : FLUID & ORGANIC CURRICULUM STRUCTURE**

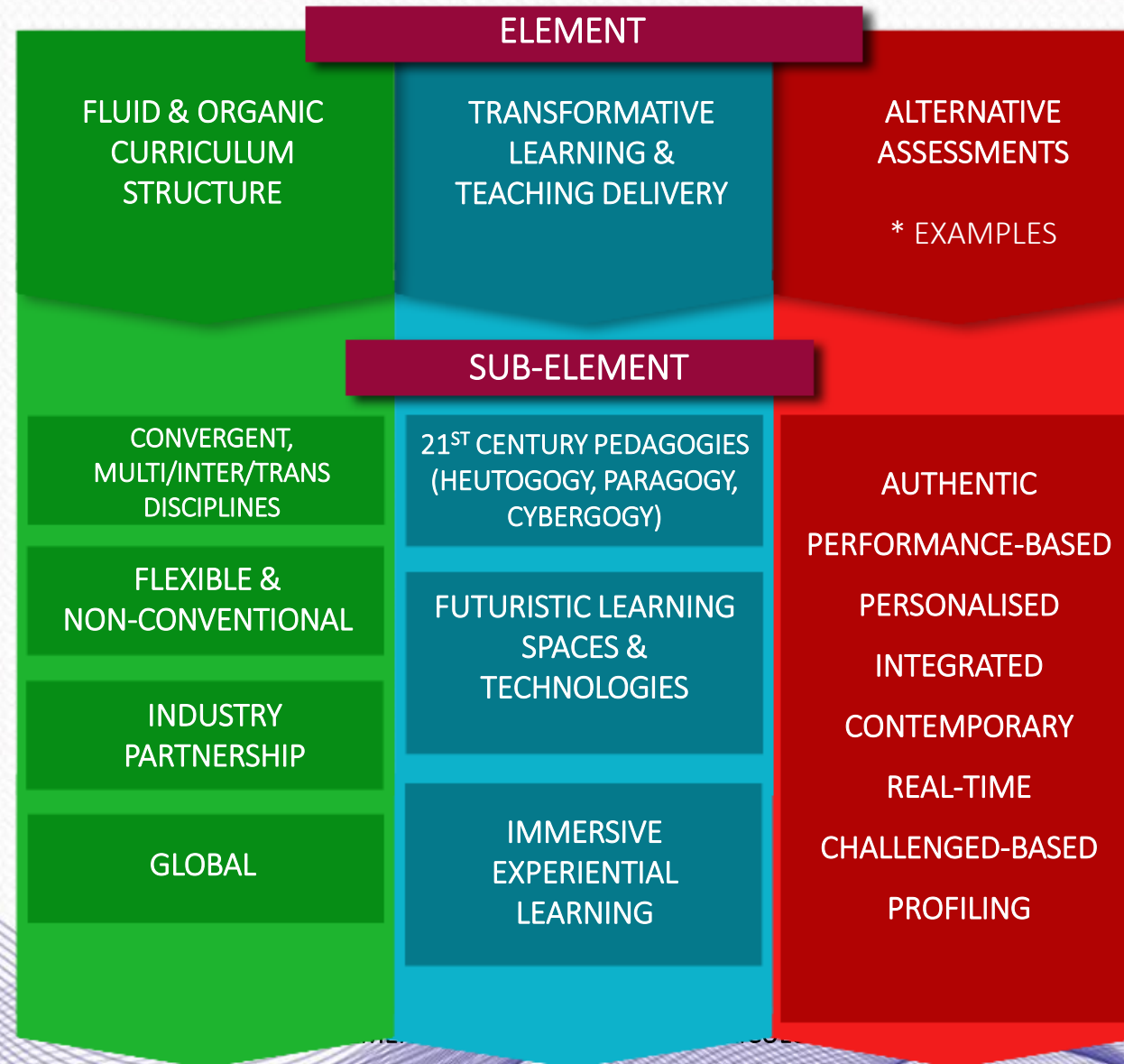
**PM DR. NAZIHA BINTI AHMAD AZLI**

UNIVERSITI TEKNOLOGI MALAYSIA

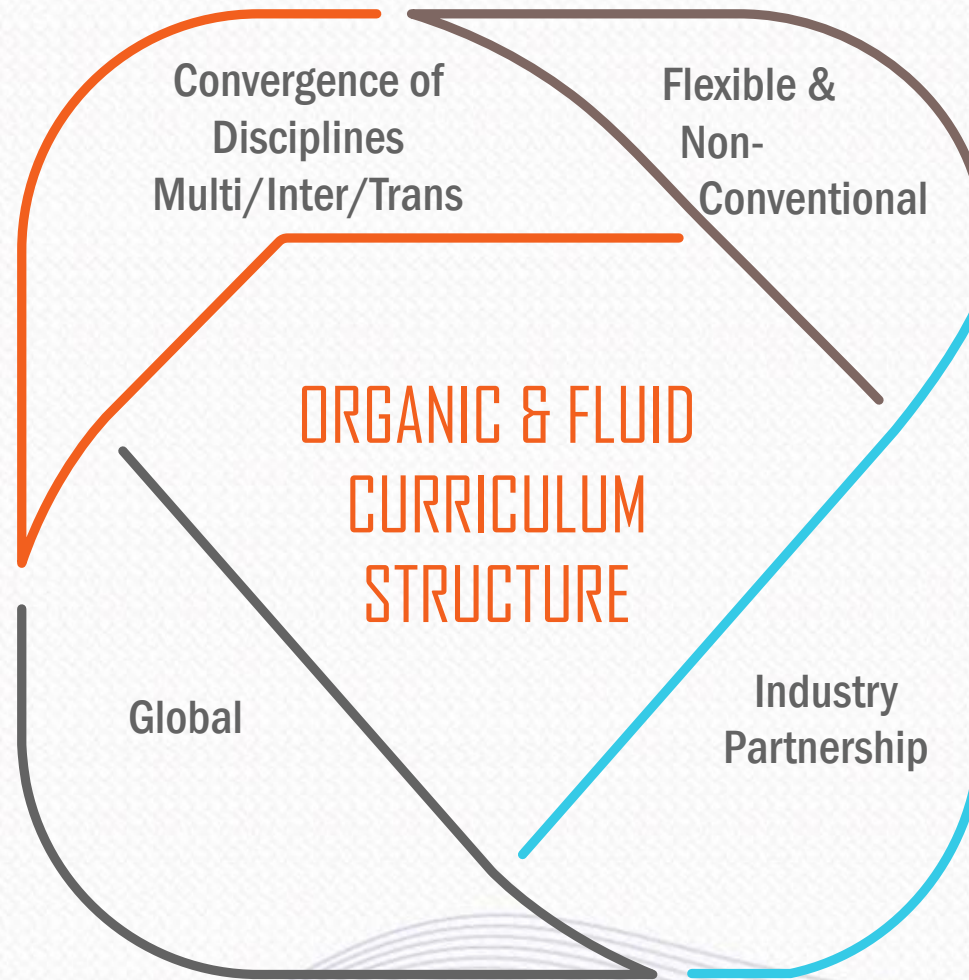




CURRICULUM 4.0: FUTURE READY CURRICULUM

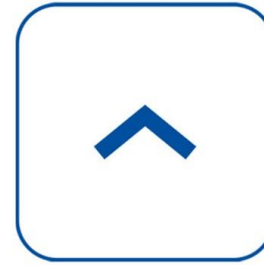








Multi/Inter/Trans



Bachelor of Accounting  
Bachelor of Architecture

# SINGLE vs CONVERGENT DISCIPLINES





# CURRICULUM CONTENT

CONVERGENT  
DISCIPLINES  
MULTI/INTER/TRANS

## Multidisciplinary

- Expansion of the main field by adding knowledge from a different field (stay within boundaries) - **additive**

## Interdisciplinary

- Combination of knowledge from two or more different fields, without changing the knowledge within the fields (harmonizes links between disciplines into a coordinated and coherent whole) – **interactive**

## Transdisciplinary

- Full interaction of two or more disciplines in the perspective of solution of real-world problems. It is a combination of field of knowledge across disciplines that eventually develops into a new knowledge field - **holistic**





# CONVERGENT DISCIPLINES EXAMPLES



Bachelor of  
Psychology with  
Human Resource  
Development

Master of Chemical  
Engineering with  
Entrepreneurship

Bachelor of Arts in  
Interdisciplinary  
Studies

Bachelor of General  
Studies

Bachelor of Arts in  
Interdisciplinary  
Social Science

Bachelor of  
Mechatronics  
Engineering

Master of  
Bioinformatics

Bachelor of  
Computer Science  
(Bioinformatics)





# The Guardian

The university of the future will be interdisciplinary

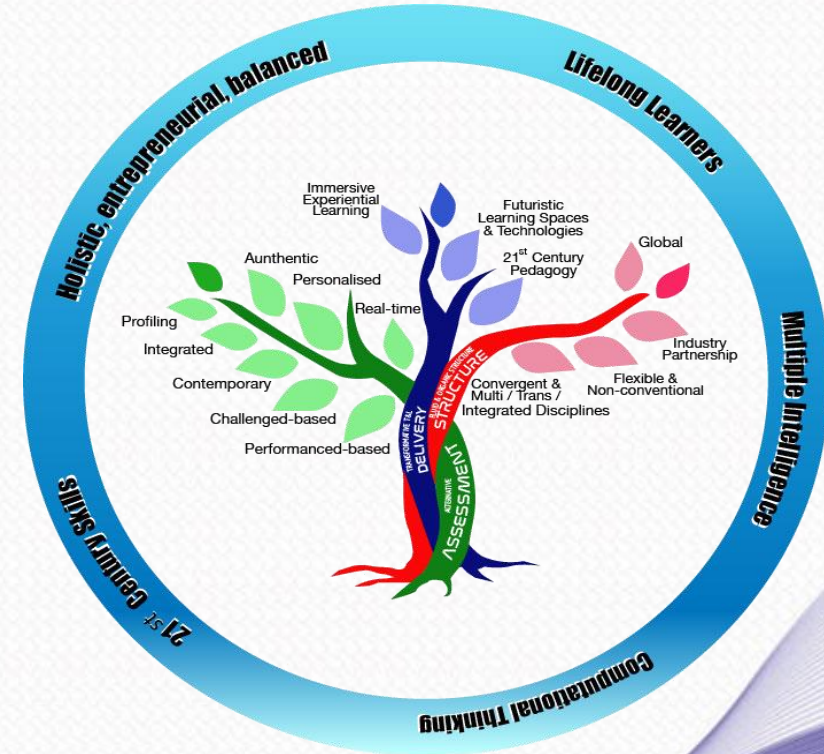
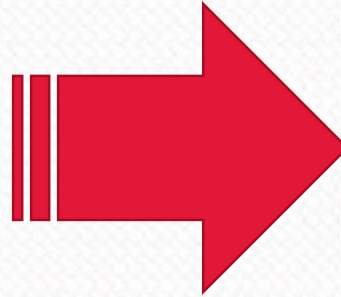
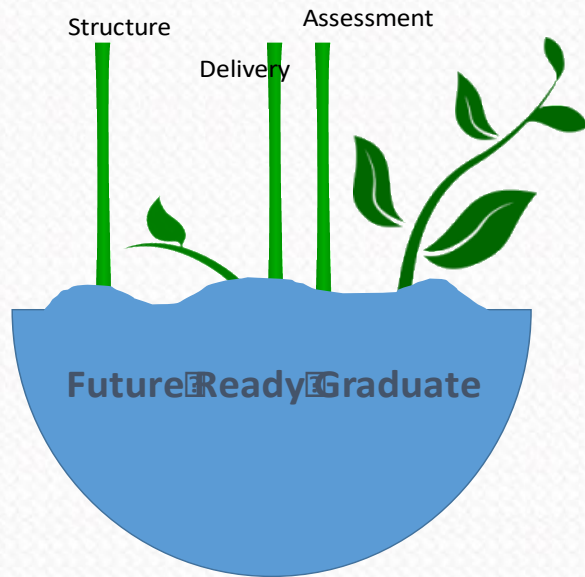
Designing courses that are **cross-disciplinary**, where one discipline learns from the perspective of another, or **interdisciplinary, where the disciplines are integrated**, allows for more context-specific programmes that better suit industry and prepare students for jobs, opening doors rather than closing them.

It benefits academics too, since research councils now rarely fund research in a single discipline. They're looking for the broader view and sharper insights that come from the intersection between multiple disciplines that defines new territory - and so should universities.





# CONCEPT OF FLUID & ORGANIC CURRICULUM







# CONCEPT OF FLUID & ORGANIC CURRICULUM

A curriculum designed with a flexible structure, updated and shaped as and when necessary in order to respond to the changing needs of the industry and students' educational experiences

A curriculum that contains the component of **contemporary (includes knowledge, skills or values)** on the aspect of the content of a course or the course as a whole. The contemporary component is **flexible in nature** and in accordance to the current/latest development and needs of knowledge and skills.





# CONCEPT OF FLUID & ORGANIC CURRICULUM

## Model A

1. Compulsory general courses - **contemporary**
2. Faculty courses
3. Core courses
4. Elective courses - **contemporary**

## Model B

Certain **percentage** of the courses in a curriculum is contemporary

## Model C

Certain **percentage** of the content of all/certain courses is contemporary

## Model D

Certain **percentage** of the courses in a curriculum is contemporary with emphasis on the elective courses

\*30% of the curriculum (for 120 credits, maximum of 36 credits)





## BACHELOR OF GENERAL STUDIES PROGRAM SARJANA MUDA PENGAJIAN AM

*Example of  
program*

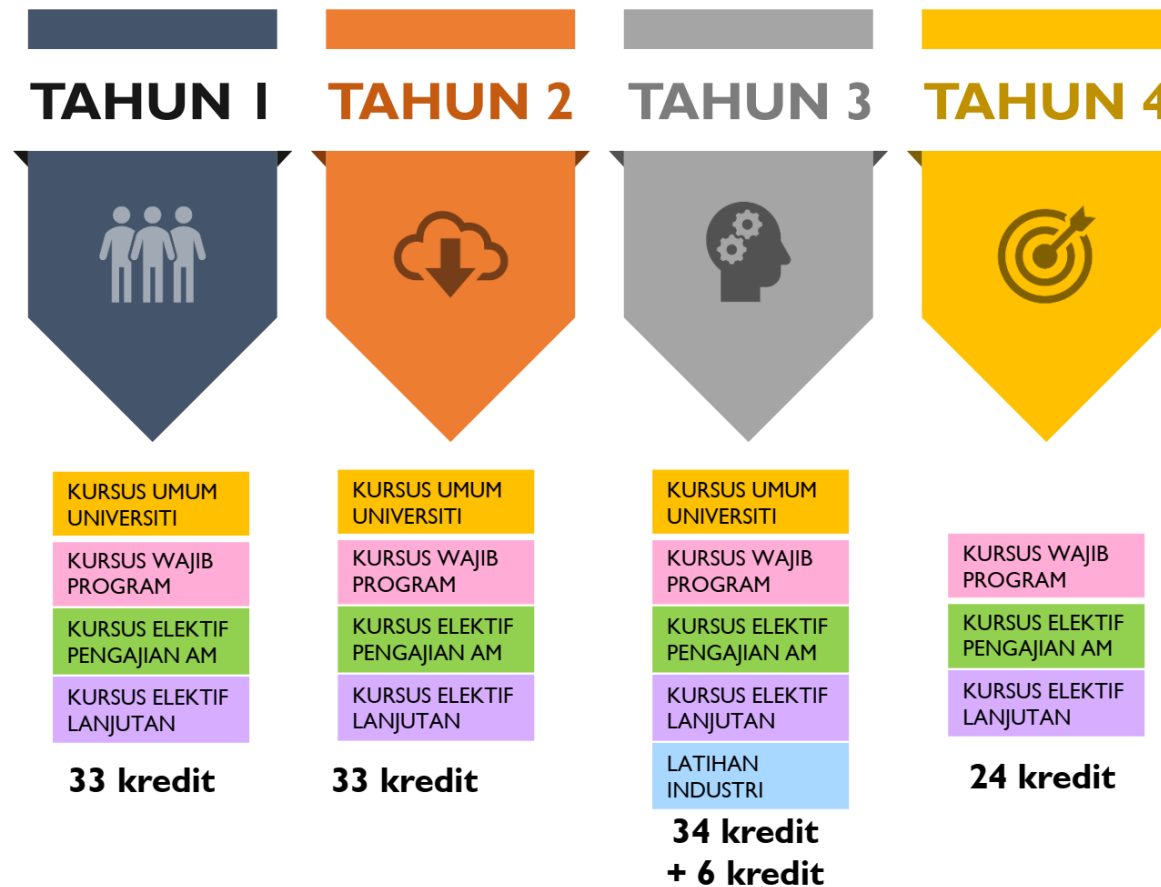
- Pembelajaran fleksibel, memenuhi kriteria Kurikulum Tersedia Masa Hadapan
- Berorientasikan keperluan pelajar
- Merentas bidang
- Atribut SMPA :
  - Sesuai dengan keperluan individu
  - Pelbagai kursus
  - Kurikulum **bolehubah** dan **organik** - Pelajar **bebas** memilih kursus dalam bidang pengkhususan mengikut keperluan **kontemporari**
  - Memperoleh bidang ilmu dan kemahiran yang luas





# BACHELOR OF GENERAL STUDIES PROGRAM SARJANA MUDA PENGAJIAN AM

## KERANGKA PELAKSANAAN PROGRAM



*Example of  
program*





# BACHELOR OF GENERAL STUDIES PROGRAM SARJANA MUDA PENGAJIAN AM

## KURSUS WAJIB PROGRAM

Memberi penekanan kepada pengetahuan dan kemahiran asas bagi tujuan pembangunan kerjaya

BIL	KOD KURSUS	NAMA KURSUS
1	SSPG 1133	Computer Literacy
2	SSPG 1143	Philosophy of Knowledge
3	SSPG 1253	Principle of Management
4	SSPG 1613 or SSPG 1623	Physics or Chemistry
5	SSPG 2113	Creativity & Innovation
6	SSPG 2143	Research Methodology
7	SSPG 2223	National Integrity
8	SSPG 2233	Mathematic & Statistics
9	SSPG 4112	Final Year Project I
10	SSPG 4214	Final Year Project II

*Example of  
program*





# BACHELOR OF GENERAL STUDIES PROGRAM SARJANA MUDA PENGAJIAN AM

## KERANGKA PELAKSANAAN PEMILIHAN KURSUS BAGI ELEKTIF PROGRAM

Example of  
program

BIDANG	MANAGEMENT	SCIENCE	COMPUTING	TECHNOLOGY	HUMANITIES
<b>ELEKTIF PENGAJIAN AM</b> (45 kredit, 15 kursus)	KURSUS TAHUN 1				
	KURSUS TAHUN 2				
	KURSUS TAHUN 3				
	KURSUS TAHUN 4				
BIDANG	MANAGEMENT	SCIENCE	COMPUTING	TECHNOLOGY	HUMANITIES
<b>ELEKTIF LANJUTAN</b> (27 kredit, 9 kursus)	KURSUS TAHUN 1				
	KURSUS TAHUN 2				
	KURSUS TAHUN 3				
	KURSUS TAHUN 4				

- Penasihat Akademik & Kerjaya akan memberikan bantuan dan bimbingan dalam usaha pelajar mencapai matlamat pendidikan dan kerjaya melalui program SMPA ini.
- Struktur kurikulum SPMA telah dibentangkan kepada MQA (**Lampiran 10** - Minit mesyuarat bersama MQA)





# BACHELOR OF GENERAL STUDIES PROGRAM SARJANA MUDA PENGAJIAN AM

Example of  
program

TAHUN I					
SEMESTER 1			SEMESTER 2		
Kod	Nama Kursus	Kredit	Kod	Nama Kursus	Kredit
*UICI 1012/ ULAM 1012	Islamic and Asia Civilizations (TITAS)/ Malay Language for Communication 2	2	*UHAS 1172/ UHAK1022	Malaysian Dynamics / Malaysian Studies 3	2
SSPG 1133	Computer Literacy	3	UHAK 1012	Graduate Success Attributes	2
SSPG 1143	Philosophy of Knowledge	3	ULAB 1122	Academic English Skills	2
			SSPG 1253	Principle of Management	3
Jumlah			Jumlah		

Pentunjuk :

KURSUS UMUM  
UNIVERSITI

KURSUS WAJIB  
PROGRAM

KURSUS ELEKTIF  
PENGAJIAN AM

KURSUS ELEKTIF  
LANJUTAN





# BACHELOR OF GENERAL STUDIES PROGRAM SARJANA MUDA PENGAJIAN AM

Example of  
program

TAHUN 2					
SEMESTER 1			SEMESTER 2		
Kod	Nama Kursus	Kredit	Kod	Nama Kursus	Kredit
ULAB 2122	Advanced Academic English Skills	2	UKQS 2XX2	Service Learning Co-curriculum	2
UICL 2302	Science and Technology Thinking	2	SSPG1613 or SSPG1623	Physics or Chemistry	3
SSPG 2133	Creativity & Innovation	3	SSPG 2143	Research Methodology	3
SSPG 2233	Mathematics & Statistics	3			
Jumlah			Jumlah		

Pentunjuk :

KURSUS UMUM  
UNIVERSITI

KURSUS WAJIB  
PROGRAM

KURSUS ELEKTIF  
PENGAJIAN AM

KURSUS ELEKTIF  
LANJUTAN





# BACHELOR OF GENERAL STUDIES PROGRAM SARJANA MUDA PENGAJIAN AM

Example of  
program

TAHUN 3					
SEMESTER 1			SEMESTER 2		
Kod	Nama Kursus	Kredit	Kod	Nama Kursus	Kredit
ULAB 3162	English for Professional Purposes	2	ULAX 1112	Foreign Language Elective	2
UHAK 1032	Introduction to Entrepreneurship	2	SSPG 2223	National Integrity	3
UHAK 2XX2/ UICL 2XX2	Generic Skills/ Knowledge Enhancement Elective	2			
Jumlah			Jumlah		

Pentunjuk :

KURSUS UMUM  
UNIVERSITI

KURSUS WAJIB  
PROGRAM

KURSUS ELEKTIF  
PENGAJIAN AM

KURSUS ELEKTIF  
LANJUTAN





# BACHELOR OF GENERAL STUDIES PROGRAM SARJANA MUDA PENGAJIAN AM

Example of  
program

TAHUN 3		
SEMESTER 1		
Kod	Nama Kursus	Kredit
SPPG 3006	Industrial Training	6
Jumlah		6

TAHUN 4					
SEMESTER 1			SEMESTER 2		
Kod	Nama Kursus	Kredit	Kod	Nama Kursus	Kredit
SSPG 4112	Final Year Project I	2	SSPG 4214	Final Year Project II	4
Jumlah			Jumlah		

Pentunjuk :

KURSUS WAJIB  
PROGRAM

KURSUS ELEKTIF  
PENGAJIAN AM

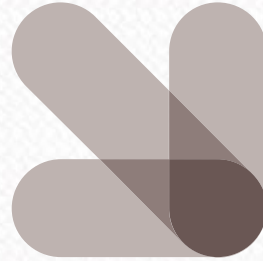
KURSUS ELEKTIF  
LANJUTAN





# FLEXIBLE & NON-CONVENTIONAL

PROMOTES  
ACCESS TO  
EDUCATION AT  
ANY TIME AND  
ANY PLACE



LEARNING MODEL,  
PERSONALISATION  
AND LEARNER  
ENGAGEMENT



## DIMENSIONS OF FLEXIBLE CURRICULUM

RELATIONS  
AND  
PARTNERSHIP  
WITH  
EXTERNAL  
PARTIES



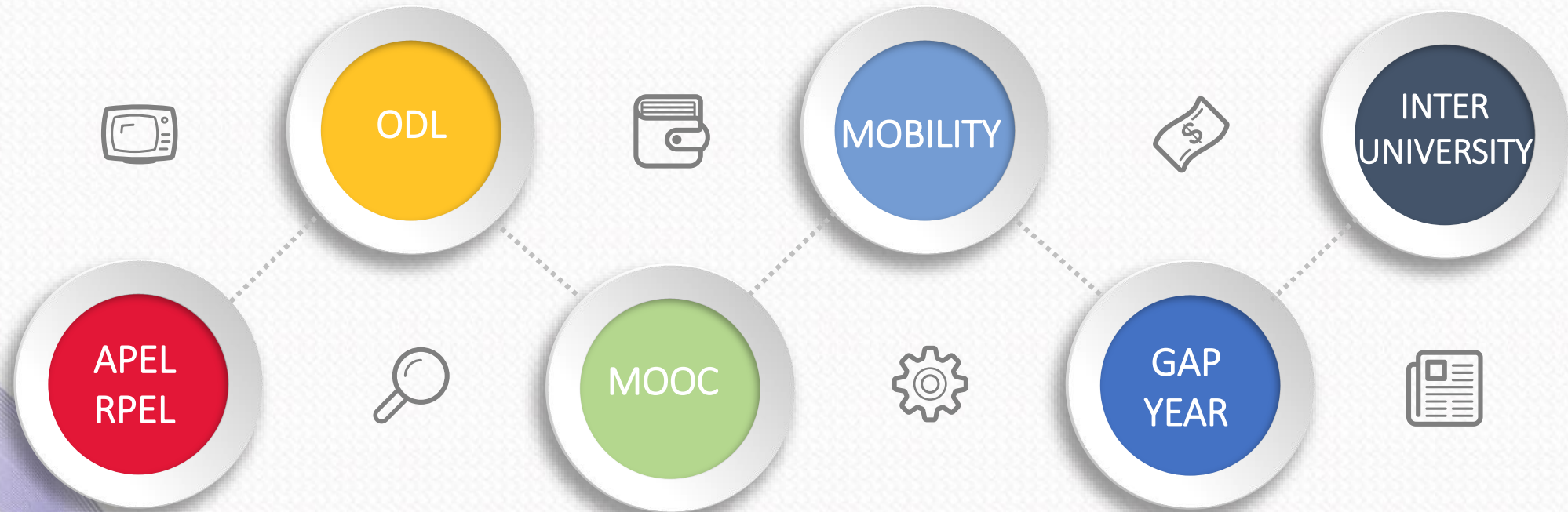
ENTRY,  
TRANSITION,  
PROGRESSION  
AND EXIT







# FLEXIBLE & NON-CONVENTIONAL







# FLEXIBLE & NON-CONVENTIONAL

## Innovative Curriculum Examples

POPBL (Aalborg  
Model)

Integrated EP  
(Univ. College  
London)

Innovation &  
Design Centric  
Program iDCP  
(NUS)

Interdisciplinary  
EP (Purdue  
University)

PBL

CDIO (Singapore  
Poly)





# POPBL (Aalborg Model)

## Study Structure

Bachelor programmes		Master programmes
	<b>10. Semester</b>	<b>Master's thesis</b>
	<b>9. semester</b>	<b>Specialisation</b>
	<b>8. semester</b>	
<b>Bachelor project</b>	<b>7. semester</b>	
<b>Specialisation</b>	<b>6. semester</b>	<b>Bachelor education</b>
<b>Bachelor education</b>	<b>5. semester</b>	
	<b>4. Semester</b>	
	<b>3. semester</b>	
<b>Basic education</b>	<b>2. semester</b>	<b>Basic education</b>
	<b>1. semester</b>	





# POPBL (Aalborg Model)

## Semester Structure

Project courses (P) –  
supporting project  
work – min. 25%  
(7-8 ECTS)

Study courses (S) –  
general knowledge –  
max. 25% (7-8 ECTS)

Separate exams

Project work – groups of 2 – 7 students  
– min. 50% (15 ECTS)

P-courses and project examined together

1 semester = 15 weeks + 5 weeks = 30 ECTS = 900 hours student work

\*ECTS: European Credit Transfer System





# POPBL (Aalborg Model)

**Semester Timing**

10 Mm/week – 1 Mm = 4 hours = 1/2 day

<b>Mm. 1</b>	<b>S-course 1</b>	<b>S-course 2</b>	<b>Project work</b>
<b>Mm. 2</b>			
<b>Mm. 3</b>	<b>P-course 2</b>		
<b>Mm. 4</b>		<b>P-course 1</b>	
<b>Mm. 5</b>	<b>P-course 2</b>		
<b>Mm. 6</b>			
<b>Mm. 7</b>	<b>P-course 1</b>		
<b>Mm. 8</b>	<b>Project work</b>		
<b>Mm. 9</b>			
<b>Mm. 10</b>	<b>Free study act.</b>	<b>Free study act.</b>	
	<b>5 weeks</b>	<b>5 weeks</b>	<b>5 weeks</b>





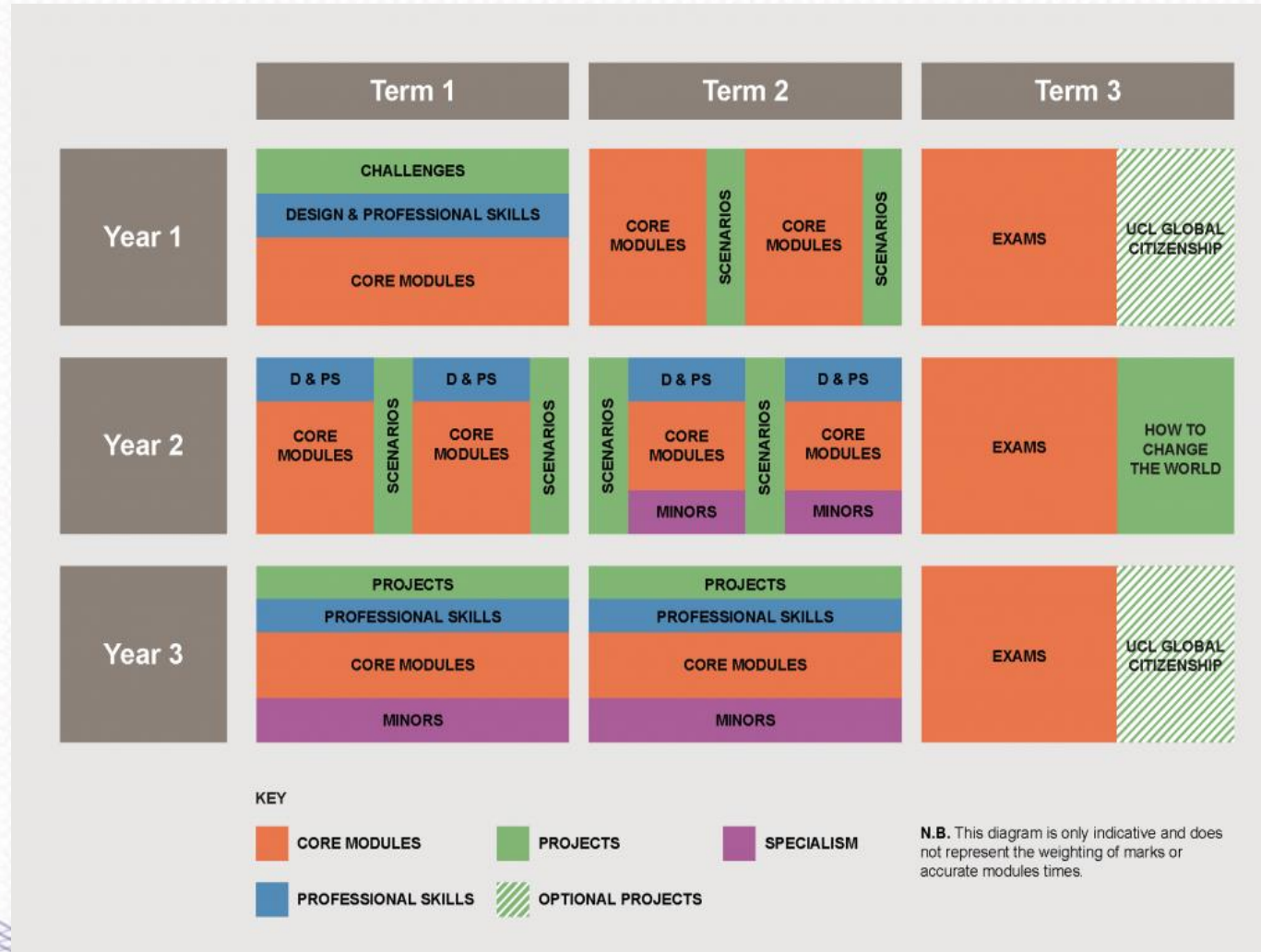
## INTEGRATED ENGR. PROGRAM (IEP)

- A connected curriculum, punctuated with problem-based and research-based activities
- Inter-disciplinary approach (7 undergraduate departments - >700 students)
- Year 1 foundations, upper year projects and minor streams
- Minors - topical and inter-disciplinary
- Review the balance of assessment & delivery styles
- Review of discipline specific curriculum





# INTEGRATED ENGR. PROGRAM (IEP)







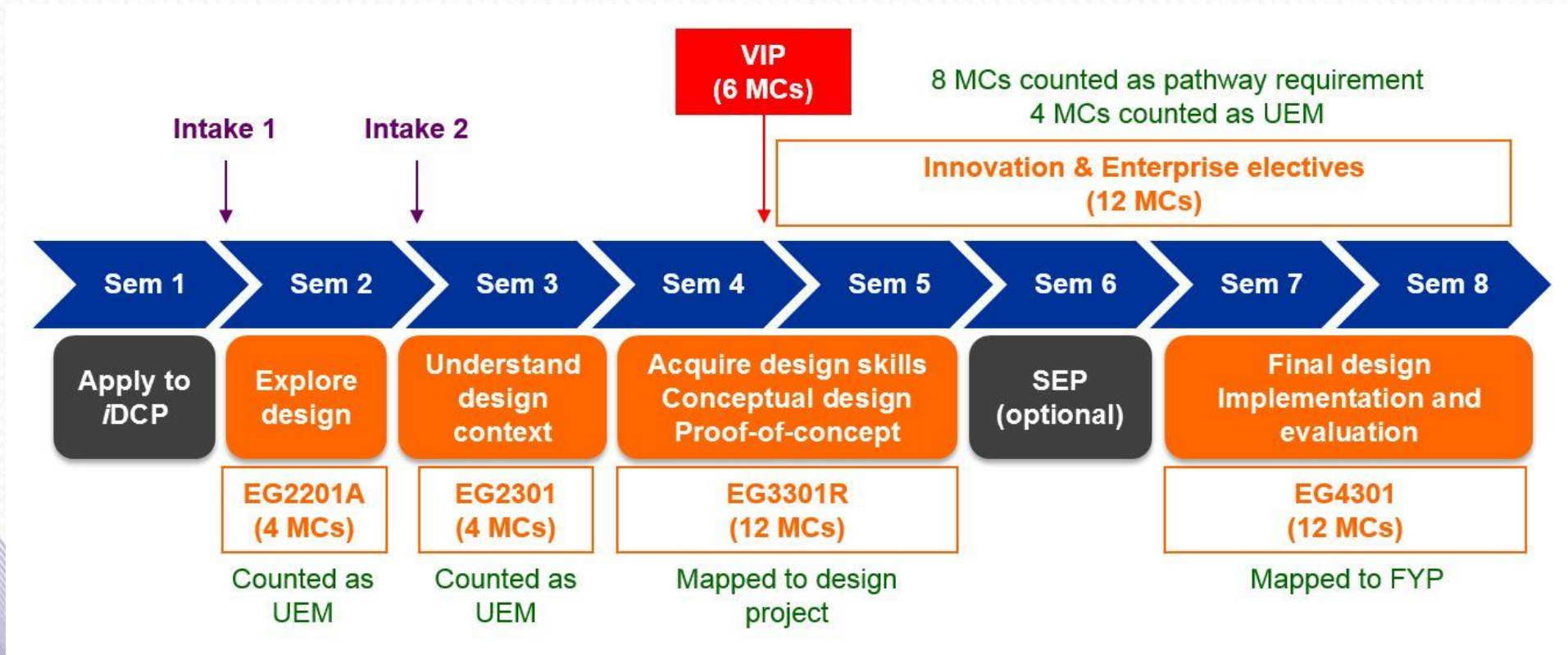
## INNOVATION & DESIGN CENTRIC PROGRAM (iDCP)

- 20 out of 160 Modular Credits, MCs (12.5%) are open for electives
- 100 students per intake – total 400 students in the whole program at a time
- **Real world problems & industry based problems**
- iDCP projects accepted as Capstone Design Project and Final Year Projects





# INNOVATION & DESIGN CENTRIC PROGRAM (iDCP)







# INTERDISCIPLINARY ENGINEERING PROGRAM

## Interdisciplinary Engineering Studies (IDES)

- Designed for students who do not plan to practice as an engineer
- Offers a customized, student-designed option

## Multidisciplinary Engineering (MDE)

- Designed to prepare graduates to practice engineering
- Offers a variety of plans of study at the cutting edge of new and emerging areas of engineering
- Offers a customized, student-designed option





**PURDUE**  
UNIVERSITY

# INTERDISCIPLINARY ENGINEERING PROGRAM

## Interdisciplinary Engineering Studies (IDES)

- Flexible plan of study that can be tailored to include its own title and selection of courses
  - Develop own individual plan of study or select one of the established concentrations such **Visual Design Engineering Studies, Pre-Medical Engineering Studies, Pre-Law Engineering Studies** etc.
- Limited enrolment (fewer than 100 total students), so the program remains counselling-intensive
- Bachelor of Science in Engineering (BSE) or Bachelor of Science (BS) degree





# INTERDISCIPLINARY ENGINEERING PROGRAM

## Multidisciplinary Engineering (MDE)

- Flexible plan of study that can be tailored to include its own title and selection of courses
  - Develop own individual plan of study or select one of the established focused concentrations i.e. **Acoustical Engineering, Engineering Management, General Engineering, Visual Design Engineering, Lighting Engineering, Nano-Engineering**
- Limited enrolment (fewer than 100 total students), so the program remains counselling-intensive
- Bachelor of Science in Engineering (BSE) or Bachelor of Science (BS) degree





# PROBLEM-BASED LEARNING

Conventional Curriculum-content as  
an organizational structure

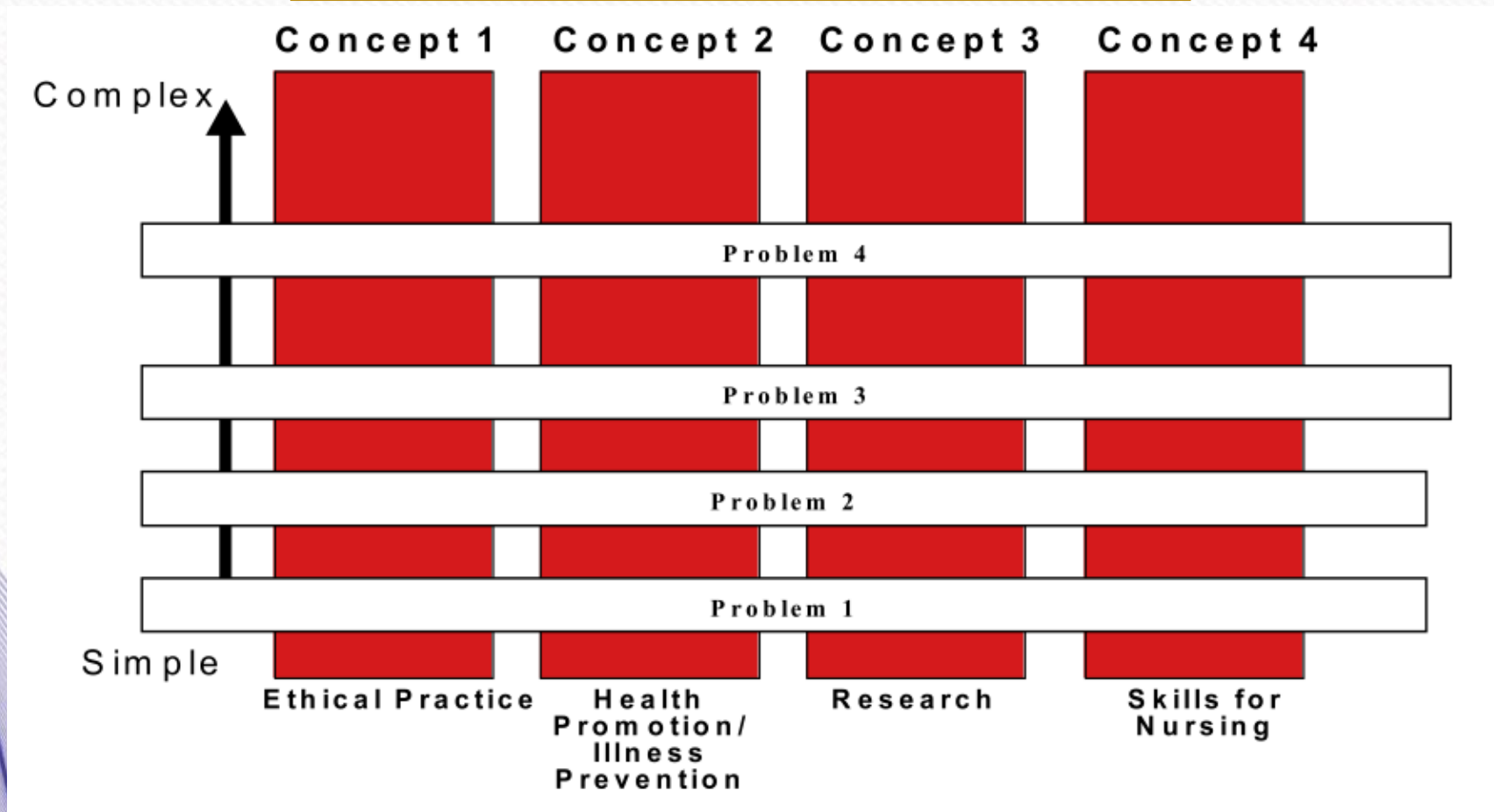






# PROBLEM-BASED LEARNING

PBL Curriculum-concepts as an organizational structure







# CDIO (CONCEIVE-DESIGN- IMPLEMENT- OPERATE)

- Conceiving-Designing-Implementing-Operating should be the context, but not the content, of engineering education
  - Closely aligned to engineering practice
  - Communicates the rationale and relevance of what students are learning
  - Interconnects concepts and knowledge that builds on each other
  - Increase retention of new knowledge and skills





# CDIO (CONCEIVE-DESIGN- IMPLEMENT- OPERATE)

- Adopted by 6 academic schools, 15 programs
  - ✓ Architecture and the Built Environment
  - ✓ Chemical and Life Sciences
  - ✓ Electrical and Electronic Engineering
  - ✓ Mechanical and Aeronautical Engineering
  - ✓ Digital Media and Info-Comm Technology
  - ✓ Singapore Maritime Academy





# CDIO (CONCEIVE-DESIGN- IMPLEMENT- OPERATE)

*The Syllabus\**

## 1. Disciplinary Knowledge & Reasoning (Learning to Know)

- Knowledge of underlying mathematics and sciences
- Core engineering fundamental knowledge
- Advanced engineering fundamental knowledge, methods and tools

## 2. Personal and Professional Skills & Attributes (Learning to Be)

- Analytical reasoning and problem solving
- Experimentation , investigation and knowledge discovery
- System thinking
- Attitudes, thoughts and learning
- Ethics, equity and other responsibilities

## 3. Interpersonal Skills: Teamwork & Communication (Learning to Live Together)

- Teamwork
- Communications
- Communication in a foreign language

## 4. Conceiving, Designing, Implementing & Operating Systems in the Enterprise & Environmental Context (Learning to Do)

- External, societal and environmental context
- Enterprise and business context
- Conceiving, systems engineering and management
- Designing
- Implementing
- Operating

*Can be customized\**





# CDIO (CONCEIVE-DESIGN- IMPLEMENT- OPERATE)

## Integration of CDIO Skills across 3 years of Study

Program  
Structure

### Teamwork

SEMESTER 1	SEMESTER 2	SEMESTER 3	SEMESTER 4	SEMESTER 5	SEMESTER 6
Core Module 1A-1	Core Module 1B-1	Core Module 2A-1	Core Module 2B-1	Core Module 3A-1	Core Module 3B-1
Core Module 1A-2	Core Module 1B-2	Core Module 2A-2	Core Module 2B-2	Core Module 3A-2	Core Module 3B-2
Core Module 1A-3	Core Module 1B-3	Core Module 2A-3	Core Module 2B-3	Core Module 3A-3	Core Module 3B-3
Core Module 1A-4	Core Module 1B-4	Core Module 2A-4	Core Module 2B-4	Core Module 3A-4	Core Module 3B-4
Core Module 1A-5	Core Module 1B-5	Core Module 2A-5	Core Module 2B-5	Core Module 3A-5	Core Module 3B-5
Core Module 1A-6	Core Module 1B-6	Core Module 2A-6	Core Module 2B-6	Core Module 3A-6	Core Module 3B-6

**Year 1:** Exposure to  
CDIO skills

**Year 2:** Reinforcement of  
CDIO skills

**Year 3:** Practice and  
Apply of CDIO skills





# NEW PROGRAM



## Bachelor of Creative Intelligence and Innovation (BCII)

- Unique combined degree that encompasses **high-level critical and creative thinking, invention, complexity, innovation, future scenario building and entrepreneurship**; leading-edge capabilities that are highly valued in the globalised world.
- Students are selected from 17 disciplines, from all faculties.
- Integrates a range of industry experiences, real-world projects and self-initiated proposals – equipping students to address the complex challenges and untapped opportunities of our times.





# NEW PROGRAM

## Bachelor of Creative Intelligence and Innovation (BCII)

- By focusing in teams on high-level conceptual thinking and problem-solving practices, students learn to work across and between disciplines, discovering rare skills and mind-sets.
- During the process students becoming lifelong innovators, entrepreneurs, creative practitioners and change-makers.





# INDUSTRY PARTNERSHIP

## 1 INDUSTRY COLLABORATION

To ensure students are equipped with future-proof skills & competencies

## 2 INDUSTRY INPUT

Beneficial for expanding knowledge & experience of future-proof talents

## 3 FEATURES

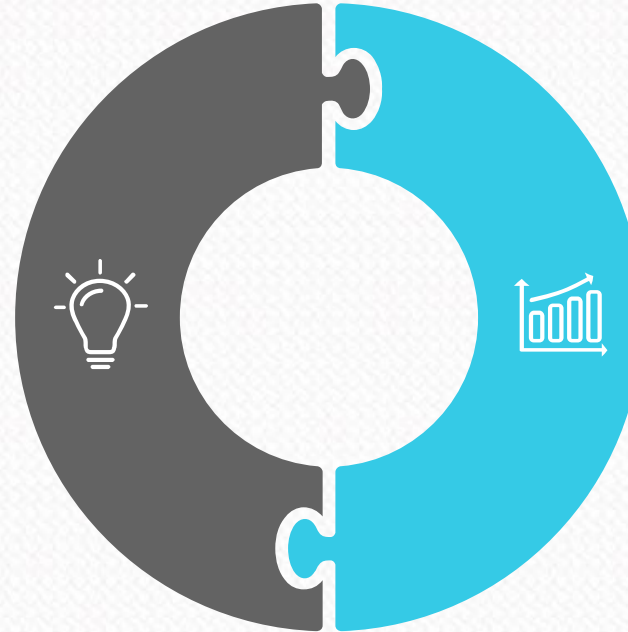
Industry involvement on the aspect of curriculum design, L&T implementation and assessment  
Students immersed in real workplace scenario  
E.g. 2u2i programs







**ADVOCATE  
GLOBAL  
COOPERATION  
WITH  
INTERNATIONAL  
UNIVERSITIES**



**GLOBAL**

**TRANSNATIONAL  
EDUCATION  
(TNE)  
(DOUBLE, DUAL  
JOINT)**



**PROMOTES  
STUDENTS'  
ADAPTABILITY  
SKILLS**



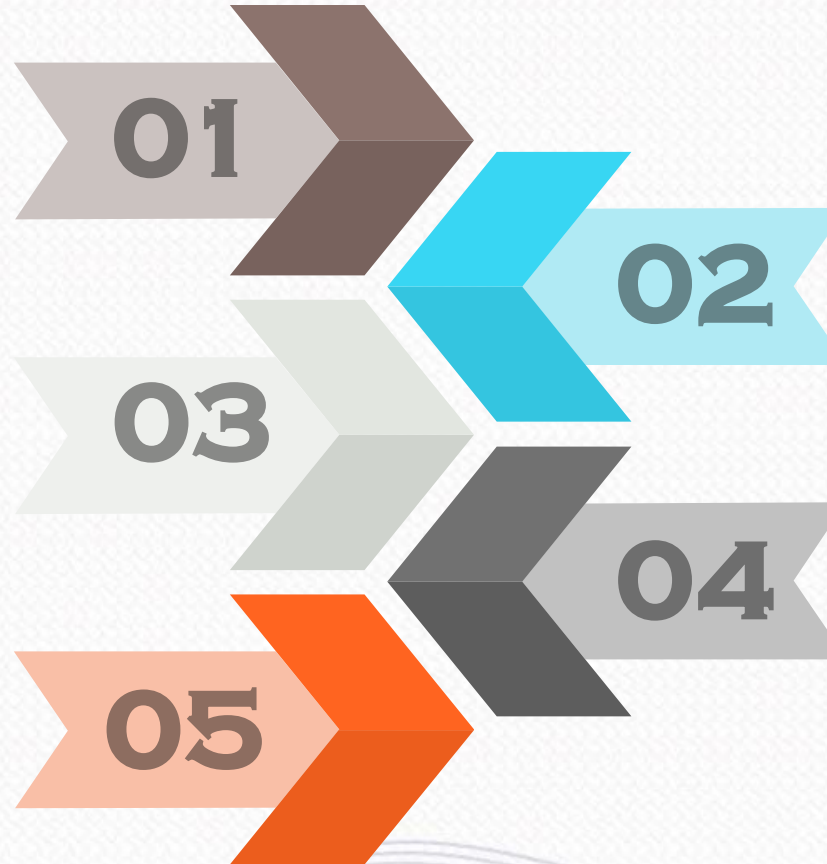


# KEY CHALLENGES

**Changing the mind  
set of the masses  
towards innovative  
curriculum**

**Getting the  
acceptance/  
approval from  
the accreditation  
bodies**

**Developing the  
talent that can  
fully implement  
innovative T&L  
method**



**Setting the  
infrastructure  
that supports  
innovation in  
curriculum and  
T&L method**

**Getting the  
commitment from  
industry as  
partners in  
developing  
innovative  
curriculum**



# THANK YOU