

Double Degree Programme in Computer Science and Economics Curriculum Structure

Applicable to students matriculating in 2016 or later

The BEng (CS) and BArts (Econs) is a 5-year double degree programme hosted by School of Computer Engineering and the Economics Division of the School of Humanities and Social Sciences (HSS). Students under this programme can opt to take the 10-week Professional Attachment.

Polytechnic students will be exempted a total of 11 AUs in the following courses:

- a. Technical Elective I (Core elective, to be taken from CE2xxx or CE3xxx courses) - 3 AUs
- b. Technical Elective 2 (Core elective, to be taken from CE4xxx or CZ4xxx) – 3 AUs
- c. CZ1003 Introduction to Computational Thinking (Core) - 3 AUs
- d. *CZ1004 Introduction to Computing Systems (Core) - 2 AUs

AU requirements

Type	Total No. of AUs	%
Depth (CE Core)	98	55%
Depth (Econs Core)	64	36%
Breadth	16	9%
Grand Total	178	100%

* For 2016 Cohort, CE1004 is named as Inventions and Innovations in Computing.

Option 1: 10-week Professional Attachment (PA)

Course Code and Title	Type (i.e. Core/ Major PE/ GER core/ GER elective/ Unrestricted Elective)	No of Hours Per Week				AU	Pre-requisite / Remarks
		Lec	Tut	Lab	Total		
YEAR 1 SEMESTER 1							
CZ1011 Engineering Mathematics I	Core (CS)	2	1	1 ⁺	4	3	-
CZ1012 Engineering Mathematics II	Core (CS)	2	1	1 ⁺	4	3	CZ1011 (can be taken concurrently)
CZ1003 Introduction to Computational Thinking*	Core (CS)	2	1	1	4	3	-
CZ1004 Introduction to Computing Systems**	Core (CS)	1	1	1 ⁺	2	2	-
HE1001 Microeconomic Principles	Core (Econ)	2	1	-	3	3	-
HE1002 Macroeconomic Principles	Core (Econ)	2	1	-	3	3	
GC0001 Introduction to Sustainability: Multidisciplinary Approaches and Solutions	GER core					1	online course
TOTAL		11	6	2+3 ⁺	20	18	
YEAR 1 SEMESTER 2							
CZ1005 Digital Logic	Core (CS)	2	1	1	4	3	
CZ1006 Computer Organisation and Architecture	Core (CS)	2	1	1	4	3	CZ1005 (can be taken concurrently)
CZ1007 Data Structures	Core (CS)	2	1	1	4	3	CZ1003
MH1812 Discrete Mathematics	Core (CS)	2	1	1 ⁺	4	3	-
HE1005 Intro to Probability & Statistical Inference	Core (Econ)	2	1	-	4	3	
HE2001 Intermediate Microeconomics	Core (Econ)	2	1	-	3	3	HE1001
ML0001 Absolute Basics for Career by MLCPS (Margaret Lien Centre for Professional Success)	GER core					1	online course
TOTAL		12	6	3+1 ⁺	23	19	

** For 2016 Cohort, CE1004 is named as Inventions and Innovations in Computing.

Course Code and Title	Type (i.e. Core/ Major PE/ GER core/ GER elective/ Unrestricted Elective)	No of Hours Per Week				AU	Pre-requisite / Remarks
		Lec	Tut	Lab	Total		
YEAR 2 SEMESTER 1							
CZ2001 Algorithms	Core (CS)	2	1	1 ⁺	3	3	CZ1007, Cz1012, MH1812
CZ2002 Object Oriented Design & Programming	Core (CS)	2	1	1	4	3	CZ1007
CZ2004 Human Computer Interaction	Core (CS)	2	1	1	4	3	-
CZ2007 Introduction to Databases	Core (CS)	2	1	1	4	3	CZ2001 (can be taken concurrently)
HW0188^ Engineering Communication I	GER core	-	2	-	2	2	HW0001
HE2005 Principles of Econometrics	Core (Econ)	2	1	-	4	3	HE1005
HY0001 Ethics & Moral Reasoning	GER core					1	online course
TOTAL		10	7	3+1 ⁺	21	18	
YEAR 2 SEMESTER 2							
CZ2003 Computer Graphics and Visualisation	Core (CS)	2	1	1	4	3	CZ1011
CZ2005 Operating Systems	Core (CS)	2	1	1	4	3	CZ1006, CZ1007
CZ2006 Software Engineering	Core (CS)	2	1	1	4	3	CZ2002 (can be taken concurrently)
CZ3001 Advanced Computer Architecture	Core (CS)	2	1	1	4	3	CZ1006
HE2002 Intermediate Macroeconomics	Core (Econ)	2	1	-	3	3	HE1002
HE3021 Intermediate Econometrics	Core (Econ)	2	1	-	3	3	HE2005 or at least an A grade in HE2004
TOTAL		12	6	4	22	18	

[^] Should there be insufficient vacancies, students will take Eng Comm I & II in the following semester.

Course Code and Title	Type (i.e. Core/ Major PE/ GER core/ GER elective/ Unrestricted Elective)	No of Hours Per Week				AU	Pre-requisite / Remarks
		Lec	Tut	Lab	Total		
YEAR 3 SEMESTER 1							
CZ3002 Advanced Software Engineering	Core (CS)	2	1	1	4	3	CZ2006
CZ3003 Software Systems Analysis and Design	Core (CS)	2	1	1	4	3	CZ2006 (can be taken concurrently)
CZ3005 Artificial Intelligence	Core (CS)	2	1	1	4	3	CZ1003, CZ2001
CZ0001 Engineers and Society	GER core	2	1	-	3	3	
Unrestricted Elective	Unrestricted elective	2	1	-	3	3	
Econs PE 1	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
ET0001 Enterprise & Innovation	GER core					1	online course
TOTAL		12	6	3	21	19	
YEAR 3 SEMESTER 2							
CZ3004 Multidisciplinary Design Project	Core (CS)	1	-	3	4	4	Year 3 standing
CZ3006 Net Centric Computing	Core (CS)	2	1	1	4	3	CZ1006, CZ2002
CZ3007 Compiler Techniques	Core (CS)	2	1	1	4	3	CZ2001, CZ2006
Technical Elective 1* (CE200x or CE300x)	Major PE (CS)	2	1	1	4	3	
HW0288^ Engineering Communication II	GER core	-	2	-	2	2	HW0188
Econs PE 2	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
ML0002 Career Power Up! by MLCPS	GER core					1	online course
CZ3126 Professional Attachment (Special Semester)	Core (CS)	-	-	-	-	5	
TOTAL		9	6	6	21	24	

Course Code and Title	Type (i.e. Core/ Major PE/ GER core/ GER elective/ Unrestricted Elective)	No of Hours Per Week				AU	Pre-requisite / Remarks
		Lec	Tut	Lab	Total		
YEAR 4 SEMESTER 1							
CZ4079 Final Year Project	Core (CS)	-	-	-	-	-	
CZ4xxx Technical Elective 2*	Major PE (CS)	2	1	1	4	3	
CZ4xxx Technical Elective 3	Major PE (CS)	2	1	1	4	3	
HE4010 Singapore Economy in a Globalised World	Core (Econ)	2	2	-	4	4	HE2001, HE2002
Econs PE 3	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
TOTAL		8	5	2	15	13	
YEAR 4 SEMESTER 2							
CZ4079 Final Year Project	Core (CS)	-	-	-	-	8	
CZ4xxx Technical Elective 4	Major PE (CS)	2	1	1	4	3	
CZ4xxx Technical Elective 5	Major PE (CS)	2	1	1	4	3	
Econs PE 4	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
Unrestricted Elective	Unrestricted elective	1	-	-	1	2	
TOTAL		7	3	2	12	18	
YEAR 5 SEMESTER 1							
CZ4xxx Technical Elective 6	Major PE (CS)	2	1	1	4	3	
Econs PE 5	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
Econs PE 6	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
Econs PE 7	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
Econs PE 8	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
TOTAL		10	5	1	16	15	

Course Code and Title	Type (i.e. Core/ Major PE/ GER core/ GER elective/ Unrestricted Elective)	No of Hours Per Week				AU	Pre-requisite / Remarks
		Lec	Tut	Lab	Total		
YEAR 5 SEMESTER 2							
Econs PE 9	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
Econs PE 10	Major PE (Econ)	2	2	-	4	4	HE1005, HE2005
Econs PE 11	Major PE (Econ)	2	2	-	4	4	HE1005, HE2005
Econs PE 12	Major PE (Econ)	2	2	-	4	4	HE1005, HE2005
TOTAL		8	7	-	15	15	
GRAND TOTAL (Years 1 to 5)							178

* Exempted AUs for Polytechnic students with relevant diplomas

+ An additional 10 hours per semester have been allocated for these non-lab based courses for Example Classes. Faculty can use these time slots for their pedagogical needs such as to reinforce concepts, provide additional coaching, give more worked examples, allow students to do practice exercises or do research or work on the computers etc.

List of Courses which contribute to BEng (CS) degree

List of courses that contribute towards BEng (Computer Science)				AU Load	
Discipline Requirement	Core	MH1812	Discrete Mathematics	3	79 AUs
		CZ1011	Engineering Mathematics I	3	
		CZ1012	Engineering Mathematics II	3	
		CZ1003	Introduction to Computational Thinking	3	
		CZ1004	Introduction to Computing Systems	2	
		CZ1005	Digital Logic	3	
		CZ1006	Computer Organisation and Architecture	3	
		CZ1007	Data Structures	3	
		CZ2001	Algorithms	3	
		CZ2002	Object Oriented Design & Programming	3	
		CZ2003	Computer Graphics and Visualisation	3	
		CZ2004	Human Computer Interaction	3	
		CZ2005	Operating Systems	3	
		CZ2006	Software Engineering	3	
		CZ2007	Database Systems	3	
		CZ3001	Advanced Computer Architecture	3	
		CZ3002	Advanced Software Engineering	3	
		CZ3003	Software Systems Analysis and Design	3	
		CZ3005	Artificial Intelligence	3	
		CZ3006	Net Centric Computing	3	
		CZ3007	Compiler Techniques	3	
		CZ3004	Multidisciplinary Design Project	4	
		CZ3126	Professional Attachment	5	
		CZ4079	Final Year Project	8	
	Core Elective	CZ4xxx	CZ Technical Elective 1	3	18 AUs
		CZ4xxx	CZ Technical Elective 2	3	
		CZ4xxx	CZ Technical Elective 3	3	
		CZ4xxx	CZ Technical Elective 4	3	
		CZ4xxx	CZ Technical Elective 5	3	
		CZ4xxx	CZ Technical Elective 6	3	
General Education Requirements (GER)	GER (Core)	HW0188	Engineering Communication I	2	12 AUs
		HW0288	Engineering Communication II	2	
		ML0001	Absolute Basics for Career	1	
		ML0002	Career Power Up!	1	
		CZ0001	Engineers and Society	3	
		GC0001	Introduction to Sustainability: Multidisciplinary Approaches and Solutions	1	
		HY0001	Ethics & Moral Reasoning	1	
		ET0001	Enterprise & Innovation	1	

	GER(BM)	HE1001	Microeconomic Principles	3	12 AUs
	GER(LA)	HE1002	Macroeconomic Principles	3	
	GER(STS)	HE1005	Introduction to Probability & Statistical Inference	3	
	GER	HE2005	Principles of Econometrics*	3	
	UE		UE	5	17 AUs
		Any of HE2001, HE2002, HE2005, HE4010, Econs Major PEs	12		
TOTAL				138 AUs	

Option 2: 20-week Professional Internship (PI)

Course Code and Title	Type (i.e. Core/ Major PE/ GER core/ GER elective/ Unrestricted Elective)	No of Hours Per Week				AU	Pre-requisite / Remarks
		Lec	Tut	Lab	Total		
YEAR 1 SEMESTER 1							
CZ1011 Engineering Mathematics I	Core (CS)	2	1	1 ⁺	4	3	-
CZ1012 Engineering Mathematics II	Core (CS)	2	1	1 ⁺	4	3	CZ1011 (can be taken concurrently)
CZ1003 Introduction to Computational Thinking*	Core (CS)	2	1	1	4	3	-
CZ1004 Introduction to Computing Systems**	Core (CS)	1	1	1 ⁺	2	2	-
CZ1005 Digital Logic	Core (CS)	2	1	1	4	3	
HE1001 Microeconomic Principles	Core (Econ)	2	1	-	3	3	-
HE1002 Macroeconomic Principles	Core (Econ)	2	1	-	3	3	
GC0001 Introduction to Sustainability: Multidisciplinary Approaches and Solutions	GER core					1	online course
TOTAL		13	7	2+3 ⁺	24	21	
YEAR 1 SEMESTER 2							
MH1812 Discrete Mathematics	Core (CS)	2	1	1 ⁺	4	3	-
CZ1006 Computer Organisation and Architecture	Core (CS)	2	1	1	4	3	CZ1005 (can be taken concurrently)
CZ1007 Data Structures	Core (CS)	2	1	1	4	3	CZ1003
CZ2004 Human Computer Interaction	Core (CS)	2	1	1	4	3	-
HE1005 Intro to Probability & Statistical Inference	Core (Econ)	2	1	-	4	3	
HE2001 Intermediate Microeconomics	Core (Econ)	2	1	-	3	3	HE1001
ML0001 Absolute Basics for Career by MLCPS (Margaret Lien Centre for Professional Success)	GER core					1	online course
TOTAL		12	6	3+1 ⁺	23	19	

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Course Code and Title	Type (i.e. Core/ Major PE/ GER core/ GER elective/ Unrestricted Elective)	No of Hours Per Week				AU	Pre-requisite / Remarks
		Lec	Tut	Lab	Total		
YEAR 2 SEMESTER 1							
CZ2001 Algorithms	Core (CS)	2	1	1 ⁺	3	3	CZ1007, CZ1012, MH1812
CZ2002 Object Oriented Design & Programming	Core (CS)	2	1	1	4	3	CZ1007
CZ2005 Operating Systems	Core (CS)	2	1	1	4	3	CZ1006, CZ1007
CZ2007 Introduction to Databases	Core	2	1	1	4	3	CZ2001 (can be taken concurrently)
HW0188^ Engineering Communication I	GER core	-	2	-	2	2	HW0001
HE2005 Principles of Econometrics	Core (Econ)	2	1	-	4	3	HE1005
HY0001 Ethics & Moral Reasoning	GER core					1	online course
TOTAL		10	7	3+1 ⁺	21	18	
YEAR 2 SEMESTER 2							
CZ2003 Computer Graphics and Visualisation	Core (CS)	2	1	1	4	3	CZ1011
CZ2006 Software Engineering	Core (CS)	2	1	1	4	3	CZ2002 (can be taken concurrently)
CZ3003 Software Systems Analysis and Design	Core (CS)	2	1	1	4	3	CZ2006 (can be taken concurrently)
CZ3006 Net Centric Computing	Core (CS)	2	1	1	4	3	CZ1006, CZ2002
HE2002 Intermediate Macroeconomics	Core (Econ)	2	1	-	3	3	HE1002
HE3021 Intermediate Econometrics	Core (Econ)	2	1	-	3	3	HE2005 or at least an A grade in HE2004
TOTAL		12	6	4	22	18	

[^] Should there be insufficient vacancies, students will take Eng Comm I & II in the following semester.

Course Code and Title	Type (i.e. Core/ Major PE/ GER core/ GER elective/ Unrestricted Elective)	No of Hours Per Week				AU	Pre-requisite / Remarks
		Lec	Tut	Lab	Total		
YEAR 3 SEMESTER 1							
CZ3001 Advanced Computer Architecture	Core (CS)	2	1	1 ⁺	4	3	CZ1006
CZ3002 Advanced Software Engineering	Core (CS)	2	1	1	4	3	CZ2006
CZ3004 Multidisciplinary Design Project	Core (CS)	1	-	3	4	4	Year 3 standing
Econs PE 1	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
Econs PE 2	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
ET0001 Enterprise & Innovation	GER core					1	online course
TOTAL		9	4	4+1 ⁺	18	17	
YEAR 3 SEMESTER 2							
CZ3005 Artificial Intelligence	Core (CS)	2	1	1	4	3	CZ1003, CZ2001
Technical Elective 1* (CE200x or CE300x)	Major PE (CS)	2	1	1	4	3	
HW0288^ Engineering Communication II	GER core	-	2	-	2	2	HW0188
Econs PE 3	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
Econs PE 4	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
Econs PE 5	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
Econs PE 6	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
TOTAL		12	8	2	22	20	
YEAR 4 SEMESTER 1							
CZ3007 Compiler Techniques	Core (CS)	2	1	1	4	3	CZ2001, CZ2006
CZ4xxx Technical Elective 2*	Major PE (CS)	2	1	1	4	3	
CZ4xxx Technical Elective 3	Major PE (CS)	2	1	1	4	3	
CZ0001 Engineers and Society	GER core	2	1	-	3	3	
HE4010 Singapore Economy in a Globalised World	Core (Econ)	2	2	-	4	4	HE2001, HE2002

Econs PE 7	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
TOTAL		12	7	3	22	19	
YEAR 4 SEMESTER 2							
ML0002 Career Power Up! by MLCPS	GER core					1	online course (to be taken with PI)
CZ3179 Professional Internship	Core (CS)	-	-	-	-	10	
TOTAL		-	-	-	-	11	
YEAR 5 SEMESTER 1							
CZ4079 Final Year Project	Core (CS)	-	-	-	-	-	
CZ4xxx Technical Elective 4	Major PE (CS)	2	1	1	4	3	
Econs PE 8	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
Econs PE 9	Major PE (Econ)	2	1	-	3	3	HE1005, HE2005
Econs PE 10	Major PE (Econ)	2	2	-	4	4	HE1005, HE2005
TOTAL		8	5	1	14	13	
YEAR 5 SEMESTER 2							
CZ4079 Final Year Project	Core	-	-	-	-	8	
CZ4xxx Technical Elective 5	Major PE (CS)	2	1	1	4	3	
CZ4xxx Technical Elective 6	Major PE (CS)	2	1	1	4	3	
Econs PE 11	Major PE (Econ)	2	2	-	4	4	HE1005, HE2005
Econs PE 12	Major PE (Econ)	2	2	-	4	4	HE1005, HE2005
TOTAL		8	6	2	16	22	
GRAND TOTAL (Years 1 to 5)							178

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+ An additional 10 hours per semester have been allocated for these non-lab based courses for Example Classes. Faculty can use these time slots for their pedagogical needs such as to reinforce concepts, provide additional coaching, give more worked examples, allow students to do practice exercises or do research or work on the computers etc.

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List of courses that contribute towards BEng (Computer Science)				AU Load	
Discipline Requirement	Core	MH1812	Discrete Mathematics	3	84 AUs
		CZ1011	Engineering Mathematics I	3	
		CZ1012	Engineering Mathematics II	3	
		CZ1003	Introduction to Computational Thinking	3	
		CZ1004	Introduction to Computing Systems	2	
		CZ1005	Digital Logic	3	
		CZ1006	Computer Organisation and Architecture	3	
		CZ1007	Data Structures	3	
		CZ2001	Algorithms	3	
		CZ2002	Object Oriented Design & Programming	3	
		CZ2003	Computer Graphics and Visualisation	3	
		CZ2004	Human Computer Interaction	3	
		CZ2005	Operating Systems	3	
		CZ2006	Software Engineering	3	
		CZ2007	Database Systems	3	
		CZ3001	Advanced Computer Architecture	3	
		CZ3002	Advanced Software Engineering	3	
		CZ3003	Software Systems Analysis and Design	3	
		CZ3005	Artificial Intelligence	3	
		CZ3006	Net Centric Computing	3	
		CZ3007	Compiler Techniques	3	
		CZ3004	Multidisciplinary Design Project	4	
		CZ3179	Professional Internship	10	
		CZ4079	Final Year Project	8	
	Core Elective	CZ4xxx	CZ Technical Elective 1	3	18 AUs
		CZ4xxx	CZ Technical Elective 2	3	
		CZ4xxx	CZ Technical Elective 3	3	
		CZ4xxx	CZ Technical Elective 4	3	
		CZ4xxx	CZ Technical Elective 5	3	
		CZ4xxx	CZ Technical Elective 6	3	

General Education Requirements (GER)	GER (Core)	HW0188	Engineering Communication I	2	12 AUs
		HW0288	Engineering Communication II	2	
		ML0001	Absolute Basics for Career	1	
		ML0002	Career Power Up!	1	
		CZ0001	Engineers and Society	3	
		GC0001	Introduction to Sustainability: Multidisciplinary Approaches and Solutions	1	
		HY0001	Ethics & Moral Reasoning	1	
		ET0001	Enterprise & Innovation	1	
	GER(BM)	HE1001	Microeconomic Principles	3	9 AUs
	GER(LA)	HE1002	Macroeconomic Principles	3	
	GER(STS)	HE1005	Introduction to Probability & Statistical Inference	3	
	UE		Any of HE2001, HE2002, HE2005, HE4010, Econs Major PEs		15 AUs
TOTAL				138 AUs	