Computer Engineering

Introduction

The Computer Engineering (CEN) Study Program was established in September 1987 under the Faculty of Computer Studies and since 2011 are under Faculty of Engineering BINUS UNIVERSITY. The CEN Study Program is **accredited Grade "A" by the National Board of Higher Education (BAN-PT)** in 2013 and also **accredited by the Engineering Accreditation Commission of ABET**, www.abet.org in 2015. It has various alumni who have gone on to take part in various domains of the business industry. The CEN Study Program was founded to meet the demand of knowledge about computer systems encompassing computer hardware, software and computer networks. The Institute of Electrical & Electronic Engineers (IEEE) and the Association for Computing Machinery (ACM), the well established and world-famous organizations, use the following definition: "Computer Engineering embodies the science and the technology of design, construction, implementation and maintenance of the hardware and the software components of modern computing systems and computer-controlled equipment," and its graduates stated: "Computer Engineers are solidly grounded in the theories and principles of computing, mathematics, and engineering; and apply these theoretical principles to design hardware, software, networks, and computerized equipment and instruments to solve problems in diverse application domains."

Hence, graduates of the CEN Study Program will enjoy the knowledge of computer software as well as computer hardware. This will allow graduates to contribute to any application wherever computers are used. The development of Information Technology and the need for experienced computer systems professionals is behind the innovative CEN Program. Currently, the Program covers expertise in understanding to build completed computer system solution that consists of hardware and software, ranging from communication system to intelligent embedded systems.

Vision

A study program of choice in Computer Engineering, which focuses on Intelligence, Mobility, and Secure Communication technologies, is recognized internationally, champions innovation and produces graduates with international qualification.

Mission

The mission of Computer Engineering Department is to contribute to the global community through the provision of world-class education by:

1. Educating students with the knowledge and skills in science and technology in the design, analysis and application of intelligent, mobile, and secure connectivity technologies. We prepare graduates to be ethical professionals and technopreuners, as well as to continue for advanced degrees in computer engineering or related disciplined in global community.
2. Providing a vibrant learning and research environment that nurtures the most creative, value-added and leadership talents of our graduates for the global community.
3. Improving quality of life by conducting professional services and high impact applied research in Computer Engineering related disciplines.

Program Objectives

The objectives of the program are:

1. Excel in methodological and computational skills within their professional and communities.
2. Employ effective team player and professional responsibilities to benefit the organizations and society.
3. Sustainably updating their knowledge to meet evolving global requirements.

Student Outcomes

After completing the study, graduates are:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal context.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Prospective Career of the Graduates

At the career level, computer engineering offers two principle paths – hardware and software engineering – and multiple sub specialty or areas of concentration, such as the following:

- Intelligence
- Operating System & Networks
- Telecommunication
- Robotics
- Software Application
- Computer Design & Architecture

Computer engineering exist at the intersection of electrical engineering and computer science, but its impact stretches well beyond these two areas. It has become part of a larger interdisciplinary field, integrating with areas ranging from biology to medicine, environmental engineering to physics. Indeed, computer engineering is part of numerous emerging industries. Below is a list of five emerging industries creating new opportunities for computer engineers.

- Big Data
- Nano Technology
- Cyber security
- Energy Efficient Computing
- Green Information and Communication Technology
- Internet of Things

Curriculum

The Computer Engineering curriculum is developed based on the IEEE-ACM international curriculum as well as the APTIKOM national curriculum. Both are curricula developed by professional engineers and educators in their fields who are members of a professional association. Concerning the two curriculums above, the curriculum used by the Computer Engineering Study Program can produce graduates who can answer local and global challenges.

The curriculum structure of the Computer Engineering Study Program consists of five parts. The first part is the mathematics and basic science composed of 32 credits. The second part is engineering science consisting of 31 credits. The third part is engineering design consisting of 32 credits. The fourth part is the design consisting of 6 credits, and the last part is the university courses consisting of 45 credits. Enrichment 3 + 1 program is in the university courses part that expect the students to face real computer engineering problems that exist in the area of research, industry, community development and entrepreneurship.

Course Structure

Sem	Code	Course Name	SCU	Total
1	CHAR6013	Character Building: Pancasila	2	20
	SCIE6049	Physics I	4/1	
	MATH6136	Calculus I	4	
	MATH6137	Linear Algebra	4	
	MATH6138	Chemistry	3	
	English University Courses I			
	ENGL6128	English in Focus	2	
	ENGL6130	English for Business Presentation	2	
2	CHAR6014	Character Building: Kewarganegaraan	2	20
	SCIE6050	Physics II	4/1	
	MATH6139	Calculus II	4	
	COMP6692	Physical Computing & Algorithm*	3	
	LANG6027	Indonesian	2	
	ENTR6509	Entrepreneurship: Ideation	2	
	English University Courses II			
	ENGL6129	English Savvy	2	
	ENGL6131	English for Written Business Communication	2	
3	MATH6182010	Discrete Mathematics	4	21
	STAT6151010	Probability and Statistic	4	
	CPEN6219010	Circuit & Electronics*&**	4/1	
	CPEN6246010	Digital System*,**&***	5/1	
	COMP6083010	Operating Systems	2	
4	CHAR6015010	Character Building: Agama	2	19
	CPEN6034010	Computer Organization and Architecture*&**	4	
	CPEN6220010	Computer Networks & Information Security*&**	4/1	
	CPEN6230010	IOT Design & Application*,**&***	5/1	
	CPEN6222010	Mobile Application Development for Engineering*&**	2	
5	CPEN6224010	System & Project Engineering*	4/1	20
	CPEN6083010	Digital Signal Processing*&**	2/1	
	ENTR6511001	Entrepreneurship: Market Validation	2	

Sem	Code	Course Name	SCU	Total
	Streaming: Communication System			
	CPEN6225010	Telco Network & Switching System*	2	
	CPEN6226010	Wireless Communication System*&**	4	
	CPEN6231010	Optical Fiber Communication System*	4	
	Streaming: Applied Networking			
	CPEN6227010	Advanced Computer Network*&**	4	
	CPEN6228010	Applied Network Security *	4	
	CPEN6232010	Cloud Technology Practice*	2	
	Streaming: Embedded & Intelligence System			
	CPEN6126010	Cross Platform Application Development*&**	4	
	CPEN6233010	Machine Learning Application in Robotic *	4	
	CPEN6236010	PLC Programming for Industrial Automation*	2	
	Free Electives		10	
6	**Enrichment Program I**		15	15
7	**Enrichment Program II**		16	16
8	CPEN6241010	Pre – Thesis	2	6
	CPEN6242010	Thesis	4	
	CPEN6255010	Thesis	6	
				TOTAL CREDIT 146 SCU

) This course is delivered in English* **) Entrepreneurship Embedded*

***) Global Learning System Course*

Streaming/Free Electives:

-) For 5th Semester: Students are required to choose Streaming or Free Electives. For Free Electives, students are required to choose from the list of Free Electives in Appendix.

English University Courses:

-) *For 1st Semester: English University Courses I, student with score BINUS UNIVERSITY English Proficiency Test less than 500 will take English in Focus, and student with score test greater than or equal to 500 will take English for Business Presentation*

-) *For 2nd Semester: English University Courses II, student with score BINUS UNIVERSITY English Proficiency Test less than 500 will take English Savvy, and student with score test greater than or equal to 500 will take English for Written Business Communication*

Pre-thesis (2 SCU) & Thesis (4 SCU) *can be taken in the 6th and/or 7th semester by the students who meet the requirements from the Study Program/Program*

Appendix Foreign Language Courses

Foreign Language Courses		SCU
ENGL6253010	English for Frontrunners	0
ENGL6254010	English for Independent Users	0
ENGL6255010	English for Professionals	0
JAPN6190010	Basic Japanese Language	0
CHIN6163010	Basic Chinese Language	0

1. Students with Binus University English Proficiency Test score less than 437 are required to take English for Frontrunners and English for Independent Users.
2. Students with Binus University English Proficiency Test score less than 520 are required to take English for Independent Users and English for Professionals.
3. Students with Binus University English Proficiency Test score equal to or greater than 520 are required to take English for Professionals and choose Basic Japanese Language or Basic Chinese Language.
4. Students are required to pass the foreign language courses before they take enrichment.
5. Students can see the requirements to pass the foreign language courses at BINUSMAYA – Beelingua.

Appendix: Free Electives (5th Semester)

No	Course Owner Department	Course Code	Course Name	SCU	Semester
1	Business Creation	ENTR6494005	Managing Growing Business	2	5
2	Business Management	MGMT6362005	Global Supply Chain Services	2	5
3	Business Management	MGMT6365005	Current Issue in Service Business and Technology	2	5
4	Business Management	MGMT6400005	Supply Chain Strategy	2	5
5	International Business Management	BUSS7009005	Export-Import Cost Management	2	5
6	International Business Management	MGMT6370005	E-Business for International Business	2	5
7	International Business Management	MGMT7169005	Global Supply Chain Management	2	5
8	Management	BUSS6069005	Business Simulation	2	5
9	Management	BUSS6163005	Organization Development Strategy	2	5
10	Management	BUSS6194005	Business Negotiation Strategy	2	5
11	Management	ISYS8175005	E-Business Strategy and Implementation	4	5
12	Management	MGMT6063005	Strategic Management	2	5
13	Management	MGMT6297005	Operations Management	4	5
14	Management	MGMT6412005	Customer Relationship Management	2	5
15	Accounting Bekasi	ACCT6389020	Big Data Analytics in Accounting & Finance	2	5
16	Marketing Communication	COMM6514019	Editing for Creative Program	2/2	5
17	Marketing Communication	COMM6523019	Corporate Event Management	2/2	5
18	Marketing Communication	COMM6538019	Media Promotion & Marketing in Creative Broadcasting	2	5
19	Marketing Communication	COMM6539019	Media Convergence in Creative Broadcasting	2	5
20	Marketing Communication	COMM6541019	Digital Corporate Communication	2/2	5
21	Marketing Communication	COMM6542019	Event Management for Brand	2/2	5
22	Marketing Communication	COMM6543019	Digital Brand Communicaton	2/2	5
23	Tourism	TRSM6141022	Tourism Destination and Planning Management	4	5
24	Tourism	TRSM6160022	Tourism Transportation	2	5
25	Tourism	TRSM6208022	Tourism Innovation and Product Development	4	5
26	Tourism	TRSM6196022	Tourism Community Empowerment	2	5
27	Architecture	ARCH6047014	Behavior in Architecture	2	5

No	Course Owner Department	Course Code	Course Name	SCU	Semester
28	Architecture	ARCH6061014	Sustainable Architecture	2	5
29	Architecture	ARCH6128014	Multimedia in Design Presentation	4	5
30	Architecture	ARCH6129014	Urban Housing	4	5
31	Civil Engineering	CIVL6007013	Harbour Engineering	2	5
32	Civil Engineering	CIVL6009013	Urban Drainage	2	5
33	Civil Engineering	CIVL6025013	Hydrology	2	5
34	Civil Engineering	CIVL6035013	Airport Engineering	2	5
35	Civil Engineering	CIVL6037013	Railway Engineering	2	5
36	Civil Engineering	CIVL6080013	Construction Methods & Heavy Equipment	2	5
37	Civil Engineering	CIVL8056013	Bridge Engineering	2	5
38	Civil Engineering	COMP6046013	Computer Applications in Construction Management	2	5
39	Computer Engineering	CPEN6126010	Cross Platform Application Development	4	5
40	Computer Engineering	CPEN6225010	Telco Network & Switching System	2	5
41	Computer Engineering	CPEN6232010	Cloud Technology Practice	2	5
42	Food Technology	FOOD6062015	Food Quality Assurance System	2/1	5
43	Food Technology	FOOD6063015	Food Safety & Sanitation	2/1	5
44	Industrial Engineering	ISYE6067011	Global Supply Chain	2	5
45	Industrial Engineering	ISYE6115011	Transportation Modeling	2	5
46	Industrial Engineering	ISYE6130011	Project Management	2	5
47	Business Law	LAWS6174028	Contract & Legislative Drafting	2	5
48	Business Law	LAWS6176028	Tax Law	2	5
49	Chinese Literature	CHIN6157026	Chinese Business for Etiquette (Beginner)	4	5
50	Chinese Literature	CHIN6158026	Chinese Business in Daily Communication	4	5
51	English Literature	ENGL6244024	Social Media Broadcasting	4	5
52	International Relations	INTR6161029	Political Economy of Global Media	2	5
53	International Relations	INTR6162029	Multiculturalism and Digital Society	2	5
54	International Relations	INTR8049029	Global Economic Architecture	2	5
55	Japanese Literature	JAPN6116025	Japanese Corporate Culture and Management (Nihon No Kigyou Bunka to Manejimento)	2	5
56	Primary Teacher Education	EDUC6032030	Art & Craft	2	5
57	Primary Teacher Education	EDUC6037030	Teaching English for Young Learners	2	5
58	Primary Teacher Education	EDUC6061030	ICT for Distance Learning	2	5
59	Primary Teacher Education	EDUC8004030	School Based Management	2	5
60	Cyber Security	COMP6646001	Computer Forensic	2	5
61	Mobile Application & Technology	MOBI6057001	Wearable Technology	2	5
62	Mobile Application & Technology	MOBI6059001	Mobile Programming	2	5
63	Statistics	RSCH6483001	Research Methodology in Data Science	2	5

No	Course Owner Department	Course Code	Course Name	SCU	Semester
64	Statistics	STAT6158001	Data Management and Organization	2	5
65	Computer Science	COMP6176001	Human and Computer Interaction	2/2	5
66	Computer Science	COMP6578001	Information Visualization	2	5
67	Computer Science	COMP6144001	Web Programming	2/1	5
68	Computer Science	COMP8129001	User Experience	2/2	5
69	Computer Science	ISYS6197001	Business Application Development	2/2	5
70	Animation	DSGN6689007	Concept Art & Production Design	2	5
71	Animation	DSGN6690007	Animation Storytelling	2	5
72	Creative Advertising	DSGN6661007	Photography	4	5
73	Business Information Technology	ISYS6579003	Knowledge-Based AI: Cognitive Systems	4	5
74	Information Systems	ISYS6196003	Business Analytics	2	5
75	Information Systems	ISYS6199003	Data & Text Mining	4	5
76	Information Systems	ISYS6202003	Social Informatics	4	5
77	Information Systems	ISYS6289003	Collaborative Computing	4	5
78	Information Systems	ISYS6402003	Business Analytics	2/2	5
79	Information Systems	ISYS8066003	Business Process Management	4	5
80	Information Systems Accounting & Auditing	ISYS6608003	IT Service & Risk Management	2	5
81	Information Systems Auditing	ISYS6050003	Information System Audit Fundamental	4	5

Enrichment Program I (6th Semester) & Enrichment Program II (7th Semester):

-) *Student will take one of enrichment program tracks (off campus). See enrichment appendix for the tracks detail.*

Enrichment Track Scheme

Track	Semester 6							Semester 7							
	IN	RS	EN	CD	SA	IS	etc	IN	RS	EN	CD	SA	IS	FS	etc
1	v							v							
2	v								v						
3	v									v					
4	v										v				
5	v											v			
6	v												v		
7	v													v	
8		v						v							
9		v							v						
10		v								v					
11		v									v				
12		v										v			
13		v											v		
14		v												v	
15			v					v							
16			v						v						
17			v							v					
18			v								v				

Track	Semester 6							Semester 7							
	IN	RS	EN	CD	SA	IS	etc	IN	RS	EN	CD	SA	IS	FS	etc
19			v									v			
20			v										v		
21			v											v	
22				v				v							
23				v					v						
24				v						v					
25				v							v				
26				v								v			
27				v									v		
28				v										v	
29					v			v							
30					v				v						
31					v					v					
32					v						v				
33					v							v			
34					v								v		
35					v									v	
36						v		v							
37						v			v						
38						v				v					
39						v					v				
40						v						v			
41						v								v	

Note:

IN : Certified Internship
RS : Certified Research
EN : Certified Entrepreneurship
CD : Certified Community Development
SA : Certified Study Abroad
IS : Certified Specific Independent Study
FS : Further Study
etc : Study Program Special Purposes

Description:
Student will take one of enrichment program tracks

Certified Internship Track

Code	Course Name	SCU	Total
Enrichment Program I			20
CPEN6129010	Computer Engineering Practical Experience I : For Industry Practice	8	
CPEN6243010	Computer Engineering Technical Analysis I : For Industry Practice	8	
CPEN6245010	Computer Engineering EES Experience I : For Industry Practice	4	
Enrichment Program II			20
CPEN6133010	Computer Engineering Practical Experience II : For Industry Practice	8	
CPEN6244010	Computer Engineering Technical Analysis II : For Industry Practice	8	
CPEN6136010	Computer Engineering EES Experience II : For Industry Practice	4	

Certified Entrepreneurship Track

Code	Course Name	SCU	Total
Enrichment Program I			20
ENTR6670010	Computer Engineering Practical Experience I : For Entrepreneurship - New Venture Initiation	8	
ENTR6671010	Computer Engineering Technical Analysis I : For Entrepreneurship - Product Development Process	8	
ENTR6672010	Computer Engineering EES Experience I: For Entrepreneurship - EES in New Business I	4	
Enrichment Program II			20
ENTR6673010	Computer Engineering Practical Experience I : For Entrepreneurship - Product Launching	8	
ENTR6674010	Computer Engineering Technical Analysis I : For Entrepreneurship - Business Development	8	
ENTR6675010	Computer Engineering EES Experience I: For Entrepreneurship - EES in New Business II	4	

Certified Research Track

Code	Course Name	SCU	Total
Enrichment Program I			20
RSCH6139010	Computer Engineering Practical Experience I : For Research Practice	8	
RSCH6537010	Computer Engineering Technical Analysis I : For Research Practice	8	
RSCH6539010	Computer Engineering EES Experience I : For Research Practice	4	
Enrichment Program II			20
RSCH6142010	Computer Engineering Practical Experience II : For Research Practice	8	
RSCH6538010	Computer Engineering Technical Analysis II : For Research Practice	8	
RSCH6144010	Computer Engineering EES Experience II : For Research Practice	4	

Certified Community Development Track

Code	Course Name	SCU	Total
Enrichment Program I			20
CMDV6059010	Computer Engineering Practical Experience I : For Community Development Project	8	
CMDV6316010	Computer Engineering Technical Analysis I : For Community Development Project	8	
CMDV6318010	Computer Engineering EES Experience I: For Community Development Project	4	
Enrichment Program II			20
CMDV6062010	Computer Engineering Practical Experience II : For Community Development Project	8	
CMDV6317010	Computer Engineering Technical Analysis II : For Community Development Project	8	
CMDV6064010	Computer Engineering EES Experience II: For Community Development Project	4	

Certified Study Abroad Track

Code	Course Name	SCU	Total
Elective courses list for study abroad*			
Enrichment Program I			
GLOB6005010	Elective Course for Study Abroad 1	4	
GLOB6006010	Elective Course for Study Abroad 2	4	
GLOB6007010	Elective Course for Study Abroad 3	4	
GLOB6008010	Elective Course for Study Abroad 4	4	
GLOB6009010	Elective Course for Study Abroad 5	2	
GLOB6010010	Elective Course for Study Abroad 6	2	
GLOB6011010	Elective Course for Study Abroad 7	2	20
GLOB6012010	Elective Course for Study Abroad 8	2	
GLOB6013010	Elective Course for Study Abroad 9	2	
GLOB6014010	Elective Course for Study Abroad 10	2	
GLOB6015010	Elective Course for Study Abroad 11	2	
GLOB6016010	Elective Course for Study Abroad 12	2	
GLOB6249010	Elective Course for Study Abroad 27	3	
GLOB6250010	Elective Course for Study Abroad 28	3	
GLOB6251010	Elective Course for Study Abroad 29	4	
Enrichment Program II			
GLOB6017010	Elective Course for Study Abroad 13	4	
GLOB6018010	Elective Course for Study Abroad 14	4	
GLOB6019010	Elective Course for Study Abroad 15	4	
GLOB6020010	Elective Course for Study Abroad 16	4	
GLOB6021010	Elective Course for Study Abroad 17	2	
GLOB6022010	Elective Course for Study Abroad 18	2	
GLOB6023010	Elective Course for Study Abroad 19	2	
GLOB6024010	Elective Course for Study Abroad 20	2	20
GLOB6025010	Elective Course for Study Abroad 21	2	
GLOB6026010	Elective Course for Study Abroad 22	2	
GLOB6027010	Elective Course for Study Abroad 23	2	
GLOB6028010	Elective Course for Study Abroad 24	2	
GLOB6041010	Elective Course for Study Abroad 25	3	
GLOB6252010	Elective Course for Study Abroad 30	3	
GLOB6253010	Elective Course for Study Abroad 31	4	

*) *Transferred courses will be transferred based on credit transfer policies on study program with total of 20 credits*.

Certified Specific Independent Study

Code	Course Name	SCU	Total
Elective courses list for certified specific independent study*			20
Enrichment Program I/II			
MICR6033010	Course Certification I	3	
MICR6034010	Technical Skill Enrichment I	4	
MICR6035010	Industrial Project I	9	
MICR6036010	Soft Skill Enrichment I	4	
MICR6001010	Elective Course for Micro Credential Course 1	8	
MICR6002010	Elective Course for Micro Credential Course 2	8	
MICR6003010	Elective Course for Micro Credential Course 3	6	
MICR6004010	Elective Course for Micro Credential Course 4	6	
MICR6005010	Elective Course for Micro Credential Course 5	6	
MICR6006010	Elective Course for Micro Credential Course 6	5	
MICR6007010	Elective Course for Micro Credential Course 7	5	
MICR6008010	Elective Course for Micro Credential Course 8	5	
MICR6009010	Elective Course for Micro Credential Course 9	5	
MICR6010010	Elective Course for Micro Credential Course 10	4	
MICR6011010	Elective Course for Micro Credential Course 11	4	
MICR6012010	Elective Course for Micro Credential Course 12	4	
MICR6013010	Elective Course for Micro Credential Course 13	4	
MICR6014010	Elective Course for Micro Credential Course 14	4	
MICR6015010	Elective Course for Micro Credential Course 15	3	
MICR6016010	Elective Course for Micro Credential Course 16	3	
MICR6017010	Elective Course for Micro Credential Course 17	3	
MICR6018010	Elective Course for Micro Credential Course 18	3	
MICR6019010	Elective Course for Micro Credential Course 19	3	
MICR6020010	Elective Course for Micro Credential Course 20	3	
MICR6021010	Elective Course for Micro Credential Course 21	2	
MICR6022010	Elective Course for Micro Credential Course 22	2	
MICR6023010	Elective Course for Micro Credential Course 23	2	
MICR6024010	Elective Course for Micro Credential Course 24	2	
MICR6025010	Elective Course for Micro Credential Course 25	2	
MICR6026010	Elective Course for Micro Credential Course 26	2	
MICR6027010	Elective Course for Micro Credential Course 27	2	
MICR6028010	Elective Course for Micro Credential Course 28	2	
MICR6029010	Elective Course for Micro Credential Course 29	1	
MICR6030010	Elective Course for Micro Credential Course 30	1	
MICR6031010	Elective Course for Micro Credential Course 31	1	
MICR6032010	Elective Course for Micro Credential Course 32	1	

**) For students who take BINUS certified specific independent study courses, they should take the first 4 courses on the list above (20 credits). Meanwhile, electives courses 1 to 32 are transferred courses for students who take certified specific independent study outside BINUS University. Transferred courses will be transferred based on credit transfer policies on study program with total of 20 credits.*

Further Study Track

Code	Course Name	SCU	Total
Enrichment Program II			20
ISYE6229010	Engineering System and Optimization	8	
ISYE6230010	System Simulation and Modeling	8	
RSCH6606010	Research Methodology	4	

Student should pass all of these quality controlled courses as listed below:

No.	Course Code	Course Name	Minimal Grade
1.	CHAR6013	Character Building: *Pancasila*	B
2.	COMP6692	Physical Computing & Algorithm*	C
3.	STAT6151010	Probability & Statistic	C
4.	CPEN6219010	Circuit & Electronics*	C
5.	CPEN6246010	Digital System	C
6.	CPEN6220010	Computer Network & Information Security	C
7.	CPEN6230010	IOT Design & Application	C
8.	CPEN6222010	Mobile Application Development for Engineer*	C
9.	ENTR6511001	Entrepreneurship: Market Validation	C

*) Tutorial & Multipaper