Civil Engineering

Introduction

Civil Engineering is a profession in which knowledge of mathematics and physical sciences are applied, ranging from providing structures for the use of civilization to creating, improving, and protecting the environment, as well as providing facilities for transportation, infrastructures, and industries. Civil engineers are involved in the planning, design, construction and operation of complex systems such as buildings and bridges, water purification and distribution systems, flood protections, highways, rapid transit and rail systems, coastal protection and harbors, airports, tunnels and underground constructions, dams, and power generators. Civil engineers are also involved in city planning, water, energy, and land remediation, as well as hazardous waste and chemicals disposal.

Civil Engineering Study Program at BINUS UNIVERSITY offers comprehensive programs leading to a bachelor degree in Civil Engineering.

Vision

The foremost Civil Engineering Department that is in continuous pursuit of innovation and enterprise is adaptable to global changes.

Mission

The missions of Civil Engineering Study Program are to:

1. Educating students on sustainable infrastructure by providing knowledge in Civil Engineering and related disciplines, and to prepare them for their career advanced degrees;
2. Providing a solid learning and research experience that nurtures leaders with creative and value-adding talents for the global community;
3. Conducting professional services and improve the quality of life of Indonesians and the international community.

Program Objective

The objectives of the Study Program are:

1. To continue updating their professional development in civil engineering related field to benefit the organization and society;
2. To utilize professional and ethical related skills to work productively within their professions and communities.

Student Outcomes

After completing the study, graduates:

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

Graduates of the Civil Engineering Study Program at Bina Nusantara University will be able to apply their knowledge and interpersonal skills in careers, both in private and public sectors, to conceive, plan, design, implement, operate and maintain the systems needed to support the physical infrastructure. Bina Nusantara University is committed to provide its undergraduate program with excellent academic preparation and interpersonal skills for direct entry into the profession, or post-graduate studies.

Graduates will be able to pursue a variety of career options in worldwide locations due to demands for improvements to civil infrastructure that are ever-present, because of population growth and deterioration of existing systems over time. Several career options are including but not limited to the following:

1. Structural Engineering: Structural Engineer, Project Civil Engineer, Precast Project Engineer, Civil Designer, Offshore Structure Engineer, Airfield Civil Engineer also applied programmer for structural engineering.
2. Hydrological, Water Resources Management (WAREM) and Environmental Engineering: Flood Mapping Services Manager, Water Resources Project Manager, Storm Water Management Engineer, Senior Municipal Engineer, Drainage Engineer and Hydraulic Engineer.
3. Transportation and Traffic Engineering: Transportation Project Manager, Transportation Design Manager, Traffic Engineer and Transportation Engineer.
4. Geotechnical Engineering: Geotechnical Engineering Manager, Reclamation Engineer, Soil Improvement Engineer and Foundation Engineer.
5. Highway Engineering: Bridge Engineer, Highway Design Project Manager, Highway Project Engineer, Highway Construction Inspector.
6. Construction Management: Senior Project Manager, Lean/Process Engineer, Construction QC Manager and BIM Expert.

Curriculum

Civil Engineering Study Program at BINUS UNIVERSITY utilizes information technology as an integral part of teaching and learning process, particularly through MCL (Multi Channel Learning) using two delivery methods: Face to Face (F2F) in classrooms and Guided Self Learning Class (GSLC), which allow students to further their studies independently through all sources, whether from online reading or textbook. The Civil Engineering Study Program provides an integrated educational experience that combines basic and applied science theories with practical experience in laboratory experimentations, problems solving and civil engineering designs, as well as site visits.

The curriculum in the Civil Engineering Study Program provides students with a solid foundation in science, with introductory courses in all of the Civil Engineering technical areas. During their final year, students choose one of the following Civil Engineering emphasis areas:

1. Structural Engineering
2. Hydrological, WAREM and Environmental Engineering
3. Transportation and Traffic Engineering
4. Geotechnical Engineering
5. Highway Engineering
6. Construction Management and BIM

As seniors, students will receive a more intense design experience, learning about alternative solution, feasibility, economics, and detailed design descriptions. Moreover, students will receive additional knowledge from our Guest Lecturer in one subject (Case Study in Civil Engineering) using English media (Lecturer Presentation, handbook, homework, and exams). Students will also receive General Lecture from national and international professionals (members of Associations, Industries, or Constructions). In addition, students are required to take courses in professionalism and engineering ethics. These courses will culminate in major engineering design experiences to bridge the gap between educational and professional practice.

Course Structure

Sem	Code	Course Name	SCU	Total
1	CHAR6013	Character Building: *Pancasila*	2	20
	MATH6014	Calculus I	4	
	SCIE6004	Physics I	4	
	SCIE6014	Chemistry for Civil Engineering*	2	
	CIVL6108	Drawing Construction*	2	
	CIVL6001	Introduction to Civil Engineering*	2	
	LANG6027	Indonesian	2	
	English University Courses I			
	ENGL6128	English in Focus	2	
	ENGL6130	English for Business Presentation	2	
2	CHAR6014	Character Building: *Kewarganegaraan*	2	20
	SCIE6028	Physics II	4/2	
	MATH6160	Calculus II	2	
	CIVL6085	Statics*&**	4	
	CIVL6086	Engineering Geology*	2	
	ENTR6509	Entrepreneurship: Ideation	2	
	English University Courses II			
	ENGL6129	English Savvy	2	
	ENGL6131	English for Written Business Communication	2	
3	CHAR6015	Character Building: *Agama*	2	20
	MATH6072	Numerical Analysis	2	
	CIVL6109	Integrated Pre-Construction Laboratory	1	
	MATH6022	Engineering Mathematics I	4	
	CIVL6111	Surveying*&***	3	
	CIVL6073	Mechanics of Materials**	2	
	CIVL6113	Soil Mechanics*&**	4	
	STAT6147	Statistics Method	2	
4	MATH6161	Engineering Mathematics II	2	19
	CIVL6053	Structural Analysis*	4	
	CIVL6114	Fluid Mechanics & Hydraulics*&**	4	
	CIVL6112	Construction Material Technology*&***	3	
	CIVL6110	Integrated Infrastructure Material Laboratory	1	
	CIVL6087	Foundation Engineering*&**	2/1	
	Free Electives		2	

Sem	Code	Course Name	SCU	Total
5	CIVL6025	Hydrology*&**	2	21
	CIVL6075	Theory and Design of Concrete Structures*	2/1	
	CIVL6076	Theory and Design of Steel Structures	2/1	
	ENTR6511	Entrepreneurship: Market Validation	2	
	CIVL6027	Highway Engineering*&**	2/1	
	CIVL6054	Traffic Engineering*	2	
	CIVL6115	Construction Project Management*&**	2	
	Elective Subjects : Computer Application**			
	COMP6043	Computer Applications in Structural Engineering*	2	
	COMP6044	Computer Applications in Geotechnical Engineering*	2	
	COMP6046	Computer Applications in Construction Management	2	
	COMP6045	Algorithm & Programming	2	
	Elective Subjects : Infrastructure in CE**			
	CIVL6080	Construction Methods & Heavy Equipment	2	
	CIVL6007	Harbour Engineering*	2	
	CIVL8056	Bridge Engineering*	2	
	CIVL6035	Airport Engineering*	2	
	CIVL6009	Urban Drainage	2	
	CIVL6037	Railway Engineering*	2	
	CIVL8038	Soil Improvement Method	2	
	CIVL6015	Geosyntetics Application in Civil Engineering	2	
	CIVL6030	Environmental Engineering	2	
	CIVL6002	Case Study in Civil Engineering	2	
6	**Enrichment Program I**		20	20
7	**Enrichment Program II**		20	20
8	CIVL6123	Pre Thesis	2	6
	CIVL6124	Thesis	4	
TOTAL CREDIT 146 SCU				

**) This course is delivered in English*

***) Global Learning System Course*

****) Entrepreneurship Embedded*

*****) Elective Subjects: Students should choose two credits from each elective courses list.*

Free Electives:

-) For 4th Semester: 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, students with Binus University English Proficiency Test score less than 500 will take English in Focus, and student with test score greater than or equal to 500 will take English for Business Presentation.

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

-) *Students must pass English Savvy with a minimum Grade of C.*

Appendix: Free Electives (4th Semester)

No	Course Owner Department	Course Code	Course Name	SCU	Semester
1	Business Creation	ENTR6580	Digital Business Transformation	2	4
2	Business Creation	ENTR6582	Business Strategy	2	4
3	Business Management	MGMT6399	Fundamentals of Supply Chain Management **	2	4
4	Business Management	MGMT6401	Digital Supply Chain Management	2	4
5	International Business Management	BUSS6162	Market Entry Strategy	2	4
6	International Business Management	BUSS6191	Export-Import Management	2	4
7	International Business Management	MGMT6369	Corporate Strategy in International Business	2	4
8	Management	BUSS6088	Current Issue in Business and Technology	2	4
9	Accounting	ACCT6353	Management Information System	2	4
10	Accounting	TAXN6050	Sales Tax and Customs	2	4
11	Accounting Bekasi	ACCT6382	Business Process Analysis and Solution	2	4
12	Architecture	ARCH6054	Interior Design Principles**	2	4
13	Architecture	ARCH6059	Building Material Knowledge*	2	4
14	Industrial Engineering	ISYE6041	Engineering Economy**	2	4
15	Industrial Engineering	ISYE6113	Leadership & Organizational Behavior*&**	2	4
16	Industrial Engineering	ISYE6181	System Engineering & Analysis**	2	4
17	Business Law	LAWS6159	Legal Aspect in Business	2	4
18	Business Law	LAWS6170	Investment Law	2	4
19	Business Law	LAWS6171	Business Competition & Consumer Protection Law	2	4
20	Business Law	LAWS6181	Industrial Relations & Alternative Dispute Resolution	2	4
21	International Relations	INTR6144	Contemporary Issues in European Society	2	4
22	International Relations	INTR6145	Contemporary Issues in American Society	2	4
23	International Relations	INTR6146	Contemporary Issues in East Asian Society	2	4
24	International Relations	INTR6147	Contemporary Issues in African and Middle Eastern Societies	2	4
25	Computer Science	COMP6745	Machine Learning	2	4
26	Interior Design	DSGN6608	Interior Design and culture*	2	4
27	Interior Design	DSGN6611	Business in Interior Design***	2	4
28	Business Information Technology	ISYS6577	Machine Learning & Foundations	2	4
29	Business Information Technology	ISYS6606	Smart Application	2	4
30	Information Systems	ISYS6478	Research Methods in Information Systems	2	4
31	Information Systems	ISYS6594	Coding for Finance	2	4

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	etc	IN	RS	EN	CD	SA	etc
1				v			v					
2					v		v					
3		v					v					
4	v						v					
5	v							v				
6	v									v		
7	v										v	

Note:

IN : Internship
RS : Research
EN : Entrepreneurship
CD : Community Development
SA : Study Abroad
etc : Study Program Special Purposes

Description:

Student will take one of enrichment program tracks

Enrichment Internship Track

Code	Course Name	SCU	Total
Enrichment Program I			20
CIVL6077	Industrial Experience	8	
CIVL6125	Technical Design in Civil Engineering	8	
CIVL6116	Professional Ethics and Communication	4	
Enrichment Program II			20
CIVL6081	Project Experience	8	
CIVL6126	Technical Project	8	
CIVL6083	Leadership and Organization Behavior	4	

Enrichment Research Track

Code	Course Name	SCU	Total
Enrichment Program I/II			20
RSCH6223	Research Experience	8	
RSCH6514	Scientific Writing in Civil Engineering	8	
RSCH6181	Global EES in Civil Engineering	4	

Enrichment Community Development Track

Code	Course Name	SCU	Total
Enrichment Program I/II			20
CMDV6123	Community Outreach Project Implementation	8	
CMDV6294	Community Outreach Project Design in Civil Engineering	8	
CMDV6097	Employability and Entrepreneurial Skills in Civil Engineering	4	

Enrichment Study Abroad Track

Code	Course Name	SCU	Total
Enrichment Program I/II			20
GLOB6005	Elective Course for Study Abroad 1	4	
GLOB6006	Elective Course for Study Abroad 2	4	
GLOB6007	Elective Course for Study Abroad 3	4	
GLOB6008	Elective Course for Study Abroad 4	4	
GLOB6009	Elective Course for Study Abroad 5	2	
GLOB6010	Elective Course for Study Abroad 6	2	
GLOB6011	Elective Course for Study Abroad 7	2	
GLOB6012	Elective Course for Study Abroad 8	2	
GLOB6013	Elective Course for Study Abroad 9	2	
GLOB6014	Elective Course for Study Abroad 10	2	
GLOB6015	Elective Course for Study Abroad 11	2	
GLOB6016	Elective Course for Study Abroad 12	2	
GLOB6251	Elective Course for Study Abroad 29	4	

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

The Table of Prerequisite for Civil Engineering (S1)

Course		SCU	Sem.	Prerequisite Course		SCU	Sem.
MATH6022	Engineering Mathematics I	4	3	MATH6014	Calculus I	4	1
CIVL6053	Structural Analysis	4	4	CIVL6085	Statics	4	2

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.	ENTR6511	Entrepreneurship: Market Validation	C
3.	CIVL6085	Statics*	C
4.	CIVL6113	Soil Mechanics*	C
5.	CIVL6114	Fluid Mechanics & Hydraulics	C
6.	CIVL6027	Highway Engineering*	C
7.	CIVL6075	Theory and Design of Concrete Structure	C
8.	CIVL6115	Construction Project Management	C

*) Tutorial & Multipaper