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 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 protection, highways, rapid transit and rail systems, harbors, airports, tunnels and underground construction, dams, and power generators. Civil engineers are also involved in city planning, water, air, and land remediation, as well as hazardous wastes and chemicals disposal.

Civil Engineering Study Program at Bina Nusantara 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 mission of Civil Engineering Department is to contribute to the global community through the provision of world-class education by:

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 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. Are able to apply knowledge of mathematics, science, and engineering.
2. Are able to design and conduct experiments, as well as to analyze and interpret data.
3. Are able to design a system, components, or process to meet desired needs.
4. Are able to function on multidisciplinary teams.
5. Are able to identify, formulate and solve engineering problems.
6. Have the understanding of professional and ethical responsibility.
7. Are able to communicate effectively.
8. Understands the impact of engineering solutions in a global, economic, environmental, and societal context.
9. A recognition of the need for, and an ability to engage in life-long learning.

10. Have the knowledge of contemporary issues.
11. Are able to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Prospective Career of the Graduates

Graduates of the Civil Engineering Study Program at Bina Nusantara University would 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 education.

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 include, but not limited to, the following:

1. Structural Engineering: Project Civil Engineer, Precast Project Engineer, Civil Designer, Offshore Structure Engineer, Airfield Civil Engineer.
2. Hydrological and Environmental Engineering: Flood Mapping Services Manager, Water Resources Project Manager, Storm Water Management Engineer, Senior Municipal Engineer, Drainage Engineer.
3. Transportation and Traffic Engineering: Transportation Project Manager, Transportation Design Manager, Traffic Engineer.
4. Geotechnical Engineering: Geotechnical Engineering Manager, Reclamation Engineer, Soil Improvement 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.

Curriculum

Civil Engineering Study Program at Bina Nusantara University utilizes information technology as an integral part of the teaching and learning processes, 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 theories with practical experience in laboratory experimentations, problems solving and 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 and Environmental Engineering
3. Transportation and Traffic Engineering
4. Geotechnical Engineering
5. Highway Engineering
6. Construction Management

As seniors, students receive an even more intense design experience, learning about alternative solution, feasibility, economics, and detailed design descriptions. The students also received additional knowledge from our Guest Lecturer in one subject (Case Study in Civil Engineering), which make use of English media (Lecturer Presentation, handbook, homework, and exams). They also receive General Lecture from national and international professionals (members of Associations, Industries, or Constructions). Students are also 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	
	MATH6046	Calculus II	4	
	CIVL6085	Statics*&**	4	
	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	22
	COMP6045	Algorithm & Programming	2	
	CIVL6109	Integrated Pre-Construction Laboratory	1	
	CIVL6030	Environmental Engineering*&**	2	
	MATH6022	Engineering Mathematics I	4	
	CIVL6111	Surveying*&***	3	
	CIVL6073	Mechanics of Materials**	2	
	CIVL6113	Soil Mechanics*&**	4	
	CIVL6086	Engineering Geology*	2	
4	MATH6024	Engineering Mathematics II	4	23
	CIVL6053	Structural Analysis*	4	
	CIVL6114	Fluid Mechanics & Hydraulics*&**	4	
	CIVL6112	Construction Material Technology*&***	3	
	MATH6072	Numerical analysis	2	
	CIVL6110	Integrated Infrastructure Material Laboratory	1	
	CIVL6087	Foundation Engineering*&**	2/1	
	STAT6147	Statistics Method	2	
5	CIVL6025	Hydrology*&**	2	19
	CIVL6075	Theory and Design of Concrete Structures*	2/1	
	CIVL6076	Theory and Design of Steel Structures	2/1	
	ENTR6511	Entrepreneurship: Market Validation	2	
	CIVL6054	Traffic Engineering*	2	
	CIVL6027	Highway Engineering*&**	2/1	
	CIVL6115	Construction Project Management*	2	

Sem	Code	Course Name	SCU	Total
5	**Elective Subjects : Computer Application******			19
	COMP6043	Computer Applications in Structural Engineering*	2	
	COMP6044	Computer Applications in Geotechnical Engineering*	2	
	COMP6046	Computer Applications in Construction Management	2	
6	**Enrichment Program I**		16	16
7	**Enrichment Program II**		16	16
8	CIVL6005	Thesis	6	10
	CIVL6002	Case Study in Civil Engineering*	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	Geosynthetics Application in Civil Engineering	2	
TOTAL CREDIT 146 SCU				

**) This course is delivered in English*

***) Global Learning System Course*

****) Entrepreneurship Embedded*

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

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*

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

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	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	

Notes:

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

Notes:
Student will take one of enrichment program tracks

Enrichment Internship Track

Code	Course Name	SCU	Total
Enrichment Program I			16
CIVL6077	Industrial Experience	8	
CIVL6078	Technical Design in Civil Engineering	4	
CIVL6116	Professional Ethics and Communication	4	
Enrichment Program II			16
CIVL6081	Project Experience	8	
CIVL6082	Technical Project	4	
CIVL6083	Leadership and Organization Behavior	4	

Enrichment Research Track

Code	Course Name	SCU	Total
Enrichment Program I/II			16
RSCH6223	Research Experience	8	
RSCH6166	Scientific Writing in Civil Engineering	4	
RSCH6181	Global EES in Civil Engineering	4	

Enrichment Community Development Track

Code	Course Name	SCU	Total
Enrichment Program I/II			16
CMDV6123	Community Outreach Project Implementation	8	
CMDV6083	Community Outreach Project Design in Civil Engineering	4	
CMDV6097	Employability and Entrepreneurial Skills in Civil Engineering	4	

Enrichment Study Abroad Track

Code	Course Name	SCU	Total
Enrichment Program I/II			16
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	

*)Transferred courses will be transferred based on credit transfer policies on study program with total of 16 credits.

Enrichment Further Study Track

Code	Course Name	SCU	Total
Enrichment Program II			16
CIVL6130	Applied Numerical Analysis	6	
CIVL6131	Transportation Modeling	6	
CIVL6132	Infrastructure Projcet Management	4	

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