CAPE COAST TECHNICAL UNIVERSITY

SCHOOL OF ENGINEERING
DEPARTMENT OF CIVIL ENGINEERING

NEW CURRICULUM PROPOSAL FOR

2-YEAR

BACHELOR OF TECHNOLOGY

IN

CIVIL ENGINEERING

SUBMITTED TO

NATIONAL COUNCIL
FOR
TERTIARY EDUCATION (NCTE)

JANUARY 2017

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1.0 PROGRAMME DETAILS

Name of Institution:	Cape Coast Technical University
Programme Title	BTech Civil Engineering
Name of Department:	Civil Engineering
Level of Programme:	Bachelor of Technology
Duration:	Two Years

2.0 NATIONAL RELEVANCE

The Technical Universities are public institutions of higher learning committed to the provision of career-focused education and training at the tertiary level with hands on experience and entrepreneurial development to satisfy manpower needs of the country. In their vision, the Technical Universities will become centres of excellence for the provision of career-focused practically-oriented middle and higher level manpower training for the socio-economic development of the regions and the nation in general.

The construction industry plays an essential role in the socio-economic development of country. The activities of construction firms impact significantly on the achievement of national socio-economic development goals of a country. The construction industry has made significant contribution to both industrial output and the overall GDP over the years.

Human resource challenges encountered by the construction industry and training institutions in Ghana underpinned the reasoning for the introduction of curricula for the Civil Engineering education programmes in Ghanaian Technical Universities. In its determination to assist the Technical Universities to develop highly skilled higher-level manpower for the nation's socio-economic development, the Ministry of Education working within the framework of Ghana Government Tertiary Education Reforms has encouraged Technical Universities to develop facilities, revise current curricula and introduce career-focused and competency-based programmes.

In consonance with the Technical Universities Act, 2016 (Act 922), the Cape Coast Technical University seeks to run a programme leading to the award of a Bachelor of Technology (BTech) degree in Civil Engineering. This will create an avenue for Higher National Diploma (HND) graduates to have a well-defined academic progression structure within the context of National Technical and Vocational Education and Training (TVET) Policy and Qualification Framework. This would help stem the tide of HND graduates opting for a cross-over to study for a Bachelor of Science (BSc) degree.

One of the policy objectives of the Ministry of Education (MOE) as enshrined in the Ghana Education Strategic Plans (ESP) is to strengthen the links between education and industry and thus provide employability and skill training at all levels of education.

The National Development Planning Commission has identified the weak linkage between tertiary education and industry as the major cause of emerging graduate unemployment in the country.

The mounting of a programme which would equip students with the requisite employable skills through the engagement of industry would go a long way to help reduce employment and create a stable society.

2.1 AIMS AND OBJECTIVES

The Programme aims at training practically-oriented high level manpower in advanced engineering principles, skills and professionalism needed to drive the industrialization agenda and contribute to the socio-economic development of Ghana.

This programme will equip the graduates with the necessary basic and higher engineering knowledge, skills and attitudes in order to propel them for a professional career in the Civil Engineering industry in a variety of jobs for higher-level Civil Engineering Technologists.

The Programme seeks to satisfy the following objectives:

i. To offer HND graduates the opportunities to acquire advanced education along their chosen career paths to develop competencies in their professions.
ii. To meet the need for a greater number of high level Technicians and Technologists to facilitate the industrialization of the Ghanaian construction industry;

iii. To provide opportunity and training to equip personnel within the construction and Civil Engineering industry with appropriate knowledge, skills and attitudes to improve their efficiency and effectiveness as high level supervisory personnel.

The philosophy and objectives of the programme fit into the mission and vision of the institution and are relevant to the region and the nation's development.

2.2 STUDENT LEARNING OUTCOMES

At the end of the programme participants should be able to

1. Apply knowledge of mathematics, science and engineering to solve engineering problems
2. Identify, formulate and solve complex engineering problems by selecting and applying appropriate tools and techniques
3. Perform engineering design by means of integrated design experiences
4. Understanding professional practice concepts
5. Design and conduct tests and critically analyze and interpret data
6. Design a system, component, or process to meet desired needs to within economic, environmental, social, political, ethical, and sustainability constraints.
    - Put together design calculation reports for every design task undertaken
    - Put together construction supervision reports with relevant details
    - Prepare structural integrity assessment for existing structures with respect to remodeling and renovations
7. Identify, formulate and solve complex civil engineering resource problems
8. Understanding of professional and ethical responsibility
9. Use the techniques, skills and modern engineering tools necessary for engineering practice

2.3 INADEQUACIES OF SKILLS

Employers and organizations often complain about the difficulty in finding fresh graduates with the right skills and competencies for employment. Students are graduating without the necessary skills and expertise to be employable. This is because most training institutions have not tailored

their teaching towards the needs of industry. This has resulted in skills gap which hinder the growth of construction and civil engineering firms and reduce their ability to compete.

2.4 OVERCOMING SKILLS CHALLENGES

The new program will equip students with the knowledge, right skills and attitudes required for the industry. The training will involve professionals from the industry who would be invited to give lectures and play a part in the assessment of students' project works, industrial training reports etc. Industry experts will also partake in the review of curricula. Students will undertake a full semester long industrial training during the course of training to enable them the gain experience and exposure .The Competency Based Training (CBT) method will be adopted to enable students develop the necessary competencies required for the industry.

3.0 ALIGNMENT WITH MISSION OF THE INSTITUTION

According to the Technical Universities Act,2016(Act 922)
, Technical Universities are to provide higher education in engineering ,science and technology based disciplines, technical and vocational education and training, applied arts and related disciplines.

The Programme aims at training practically-oriented high level manpower in advanced engineering principles, skills and professionalism needed to drive the industrialization agenda and contribute to the socio-economic development of Ghana.
The philosophy and objectives of the programme fit into the mission and vision of the institution and are relevant to the region and the nation's development.

4.0 TARGET MARKET AND PROSPECTS

The programme intends to target graduates with the following qualifications:

i. HND in Civil Engineering with a minimum of second class upper division with one year relevant working experience will be offered unconditional admission into the programme.

ii. Second class Lower Division with one year relevant working experience will attend a selection interview.

iii. KNUST Diploma in Civil Engineering with one year relevant working experience will be offered unconditional admission into the programme

B. Tech graduates in Civil Engineering can potentially be employed in a variety of jobs in Government Agencies, Institutions of Higher Learning and Civil Engineering and Construction firms. They can occupy the following positions in private or public organizations.

- Project Engineer
- Materials Engineer
- Site Engineer
- District Engineer
- Contractor
- Consultant
- Site Manager
- Maintenance Engineer
- Technical Instructor

They may also engage in self-employment or pursue a career in the security services.

5.0 UNIQUENESS OF PROGRAMME

To some extent, there are similarities between the programme and those run by other institutions However, in this programme, more time is allocated to practical training. A full semester in the final year has been assigned for practical industrial training .A course in engineering ethics has also been introduced into programme. The study of ethics would help students on how deal with issues such as relationship with clients, conflict of interests, public interests and also how to balance the employer's interest against the public interest. .The student will learn to promote the safety, health and security of the public in all engineering works.

To enable industry make direct input into the teaching and learning at the Technical University, The Institution has inaugurated a Departmental Advisory Board comprising members of teaching staff Department and professionals from industry. The Board serves as an advisory body to the Department

6.0 ENROLMENT PROJECTIONS

Table 1 shows the projected intake for the first five years of the programme.

Table 1: Projected enrollment for the first five years

Academic Year	Year 1	Year 2	Year 3	Year 4	Year 5
Male	25	32	30	32	35
Female	5	8	10	13	15
Total	30	35	40	45	50

7.0 STAFFING

Staff details are presented in APPENDIX A. The courses and lecturers are shown in Appendix C.

8.0 FUNDING OF NEW PROGRAMME

The summary of the financial analyses of the proposal are presented in Appendix B. Revenue shall be generated from the fees paid by the applicants. A conservative assumption was made that the student fees will increase by 10% per year .The analysis indicates that the programme would be self-sustaining. There are no loses over the five year period as shown in the five-year financial projections.

9.0 EVIDENCE OF PRACTICAL TRAINING

The Industrial Liaison of Office of the institution is in charge of ensuring that students secure industrial attachment placement and that students on industrial attachment are supervised. Students pursuing the BTech civil engineering programme undergo industrial attachment training in the third semester of the programme for six months after which students would be required to present and defend attachment report. At the end of the industrial training programme, students are expected to obtain skills and competencies necessary for the industry.

The expected competencies are:

- Apply engineering knowledge learned in the classroom environment in real industrial situations

- Learn professional engineering practices in industry
- Develop awareness about a the general workplace behaviour and interpersonal skills
- Build rapid rapport and network with future employers.
- To prepare professional work records and reports

The Department has signed memoranda of understanding (MOU) with some companies and have received letter of collaboration from others (Appendix D).

10.0 PROFESSIONAL INPUTS

The Curriculum For The programme has been subject to inputs from the professionals and other players in industry. Inputs received are shown in APPENDIX E.

APPENDIX C COURSES/LECTURERS

SEMESTER I

CODE	COURSE	T	P	C
CVE 401	Structural Design I	2	2	3
CVE 403	Foundation Engineering	2	2	3
CVE 405	Engineering Mathematics I	2	0	2
CVE 407	Integrated Project I	2	0	2
CVE 409	Environmental Quality Engineering I	2	2	3
CVE 411	Large Scale Surveying	1	4	3
CVE 413	Highway Engineering	2	2	3
CVE 415	Ethics and Communication	1	0	1
				20

SEMESTER II

CODE	COURSE	T	P	C
CVE 402	Structural Design II	2	2	3
CVE 404	Hydraulic Engineering	2	2	3
CVE 406	Engineering Mathematics II	3	0	3
CVE 408	Integrated Project II	0	6	3
CVE 410	Environmental Quality Engineering II	2	2	3
CVE 412	Computer Applications	0	4	2
CVE 414	Transportation Engineering I	2	0	2
CVE 416	Research Methodology	2	0	2
				21

SEMESTER III

CODE	COURSE	T	P	C
CVE 501	Industrial Attachment	0	30	15
				15

SEMESTER IV

CODE	COURSE	T	P	C
CVE 502	Engineering Economy	2	0	2
CVE 504	Construction Management	2	0	2
CVE 506	Project Work	0	12	6
	Elective I	3	0	3
	Elective II	3	0	3
				16

ELECTIVES

CODE	COURSE	T	P	C
CVE 508	Irrigation and Drainage Engineering	3	0	3
CVE 510	Water Resources Engineering and Management	3	0	3
CVE 512	Transportation Engineering II	3	0	3
CVE 514	Ground Engineering	3	0	3

T-Theory, P-Practical C-Credit

SEMESTER I

S/N	COURSE DESCRIPTION	COURSE CODE	LECTURER	T	P	C
1.	Structural Design I	CVE401	Mohammed ZebililahDeenHalis	2	2	3
2.	Foundation Engineering	CVE403	Daniel Yaw Osei	2	2	3
3.	Engineering Mathematics I	CVE405	Emmanuel Aidoo	2	0	2
4.	Integrated Project I	CVE407	Various	2	0	2
5.	Environmental Quality Engineering I	CVE409	James Asante Aboagye	2	2	3
6.	Large Scale Surveying	CVE411	Carlos OtooKwofie	1	4	3
7	Highway Engineering	CVE413	Ing Samuel Buenor-Adi.	2	2	3
8	Ethics and Communication	CVE415	Ing Samuel Buenor Adi/Rev Edu-Buandoh	1	0	1
			TOTAL		**20**	

SEMESTER II

S/N	COURSE DESCRIPTION	COURSE CODE	LECTURERS	T	P	C
1.	Structural Design II	CVE402	Mohammed Zebililah Deen-Halis	2	2	3
2.	Hydraulic Engineering	CVE404	Jonathan Gabriel Amissah	2	2	3
3.	Engineering Mathematics II	CVE406	Emmanuel Aidoo	3	0	3
4.	Integrated Project II	CVE408	Various	0	6	3
5.	Environmental Quality Engineering II	CVE410	Eric Awere	2	2	3
6	Computer Applications	CVE412	Jonathan Gabriel Amissah	0	4	2
7.	Transportation Engineering I	CVE414	Ing Samuel Buenor-Adi.	2	0	2
8	Research Methodology	CVE416	Asirifua Panin Obeng	2	0	2
			TOTAL		**19**	

SEMESTER III

S/N	COURSE DESCRIPTION	COURSE CODE	LECTURERS	T	P	C
1.	Industrial Attachment	CVE 501	Inspection Team		30	15
			TOTAL		**15**	

SEMESTER IV

S/N	COURSE DESCRIPTION	COURSE CODE	LECTURER	T	P	C
1.	Engineering Economy	CVE 502	Rev K. B.M. Edu-Buandoh	2	0	2
2.	Construction Management	CVE 504	John Ampah	2	0	2
3.	Project Work	CVE 506	All Lecturers	0	12	6
4.	Elective I		Lecturers	3	0	3
5.	Elective II		Lecturers	3	0	3
			TOTAL		**16**	

ELECTIVES

S/N	COURSE DESCRIPTION	COURSE CODE	LECTURER	T	P	TOTAL
1.	Irrigation and Drainage Engineering	CVE 508	Gabriel Jonathan Amissah/Eric Awerre	3	0	3
2	Water Resources Engineering and Management	CVE 510	Eric Awere/Asirifua Panin Obeng	3	0	3
3	Transportation Engineering II	CVE 512	Ing Samuel Buenor-Adi	3	0	3
4	Ground Engineering	CVE 514	Daniel Yaw Osei	3	0	3