KIGALI INSTITUTE OF SCIENCE AND TECHNOLOGY

INSTITUT DES SCIENCES ET DE TECHNOLOGIE DE KIGALI

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FACULTY OF ENGINEERING

DEPARTMENT OF
CIVIL ENGINEERING AND ENVIRONMENTAL TECHNOLOGY

PROGRAMME SPECIFICATION
(Provisional)
OF

BSc (Honours) Degree
in
Water and Environmental Engineering

Prepared in November 2008 and updated in November 2009 & in July & Dec 2011

PROGRAMME SPECIFICATION FORM

1. PROGRAMME DETAILS

1 **Programme Title**	**Degree in WATER AND ENVIRONMENTAL ENGINEERING**			
2 **Exit Awards**	**BSc(Honours) in Water and Environmental Engineering**			
3 **Modes of Attendance** *(please tick)*	Part-time		Full-time	✓
	Distance Learning		Work-based Learning	
	Other (please specify)		Short course	
4 **Resource group**: (See Notes of Guidance)	1		5	✓
	2		6	
	3		Other (write in)	
	4			
5 **First year of presentation**	2008		Current Session (short courses only)	

6 **Programme Organiser/Leader:**	Mr. G. Senthil Kumaran

7 **Programme Development Team**	
Name	**Faculty**
Mr. D HAGUMA (Chair)	FOE
(Library Representative)	
(CIT Centre Representative)	
Mr. E DUSINGIZUMUREMYI	FOE
Mrs. C RUHAMYA	FOE
Mr. F MAJORO	FOE
Mr. A MUKUBWA	FOE
Mrs. L KENTE	
8 **Faculty/ School/Centre administratively responsible for the programme**	
FOE✓ FOS SOLAS CITC CITT CCE	

2. PROGRAMME FUNDING AND NEED FOR RESOURCES (changes since Programme Proposal Form)

See Section 11

Student numbers: Intake per year 40 into Level 1
Eventual population, all years: 160

3. PROGRAMME AIMS AND RATIONALE

According to vision 2020, Rwanda is committed to reaching "Universal Education for All", which is one of the most important Millennium Development Goals. However, there is a need to educate and train people at all levels with special attention paid to the quality of education.

It is critical to understand that the economic development of Rwanda will not be effective without skilled labour. Therefore, in order to achieve vision 2020 objectives Rwanda has set four pillars and its cross-cutting areas. Human resource development and a knowledge based economy and Infrastructure development are among four pillars of vision 2020. The focused cross-cutting area is Protection of environment and sustainable natural resource management.

This programme will meet the challenging demands on manpower of all industries and government organizations in the country and in the surrounding regions, which need highly skilled professionals capable of finding solutions to problems in water and environment.

Despite abundant of water in Rwanda, the country is still facing problems of drinking water, water scarcity, irrigation, whereby available water resources are not well managed. Above all, the wastewaters produced in both rural and urban areas are directly discharged into water bodies or natural environment without any treatment. Hence, this contributes to environmental degradation, which is hindering Rwanda economic development.

Since the beginning of KIST, the department of Civil Engineering and Environmental Technology has been training students in civil and environmental technology. However, it was difficult to cover all subjects of civil engineering as well as environmental technology due to time constraints.

Department of Civil Engineering of KIST introduces the programme of Bachelor of Science (Honours) in water and Environmental Engineering based on internationally acclaimed standards, which fit well in to the KIST portfolio of programs.

The B.Sc. Water and Environment Engineering is a four year Degree Programme designed such that the admitted candidates acquire in depth knowledge and skills in **Water Resources and Environment Engineering** and basic knowledge in **Water Related Infrastructure** and **Environmental Modelling.**

Educational aims

The mission of the Water and Environmental Engineering B.Sc. degree programme is to educate Engineering leaders who will contribute to solving societal problems by improving the water infrastructure, environmental protection, natural hazard mitigation, and the efficient and sustainable functioning of engineered and natural systems Rwanda, Region, and worldwide. This mission will be achieved by:

1. Educating students with the fundamental mathematical, scientific, and engineering knowledge to have a significant and positive long-term impact on the field of water and environmental engineering.

2. Inspiring students and preparing them for successful professional careers, for further studies in high-quality graduate programmes in engineering or other professional fields, and for a lifetime of learning.
3. Emphasizing the importance of professional and personal studies, engineering and leadership as well as service to society,
4. Conducting promotion of advanced water and environment management concepts through research;
5. Building capacity of water and environment practitioners through short courses; to enhance capacity/skills of technicians involved in water and environment sectors.

4. PROGRAMME LEARNING OUTCOMES (including modules not bearing credit)

The Water and Environmental programme aims to provide all graduates with an understanding of the theory and practice of designing, modelling of water and environment systems. The programme objective is to provide sufficient flexibility in the curriculum so that graduates will have the ability to work within various fields of water and environmental sectors by using applied sciences and technologies.

A. Knowledge and Understanding

At the end of the programme students should be able to demonstrate knowledge and understanding of:

A1. Relevant physical, chemical, applied mathematical, computational and earth-scientific principles and concept;
A2. Key concepts and topics in Water and environmental engineering, both explicitly and implicitly in finding the solution of problems.
A3. Current theories and concepts in both surface and subsurface water flow, as well as river hydraulics;
A4. Fundamental principles in water and wastewater treatment along with water supply and drainage of sewerage;
A5. Codes of practice and the various standards relevant to Civil and Environmental Engineering practice.
A6. Information and communication technology within water resources and environment engineering context;
A7. Business and management techniques relevant to Civil and Environmental Engineering

B. Cognitive/Intellectual skills/Application of Knowledge

At the end of the programme students should be able to:

B1. Analyse problems, formulating them in terms of appropriate theoretical frameworks, in order to facilitate their solution.
B2. Select and apply appropriate techniques and processes in order to solve environment related problems.

B3. Identify, formulate, and solve problems related to water resources and environmental engineering;
B4. Design and implement hydraulic structures
B5. Assess the impact of engineering solutions in a global, economical, environmental, and societal context.
B6. Apply technical knowledge to produce a technical risk assessment.
B7. Apply professional knowledge to produce a commercial risk assessment.
B8. Apply technical and professional knowledge to assess environmental and social impact of engineering activities.

C. Communication/ICT/ Numeracy/Analytic Techniques/Practical Skills

At the end of the programme students should be able to:

C1. Construct and develop logical arguments, with clear identification of assumptions and conclusions.
C2. Apply relevant computer software in Water Resources and Environment Engineering design and engineering drawings
C3. Interpret Civil & Environmental Engineering drawings, implement and supervise the construction of major water or sewerage work
C4. Plan and undertake a major individual project.
C5. Observe and record accurately data and experimental evidence both in the laboratory and in the field.
C6. Prepare and deliver coherent and structured verbal and written technical reports.
C7. Adequately communicate methodologies, results, evaluations, conclusion and recommendation in oral, written and graphical form to a variety of audience
C8. Use the techniques, skills, and modern engineering tools necessary for engineering practice.
C9. Design and conduct experiments, as well as to analyse and interpret data.

D. General transferable skills

At the end of the programme students should be able to:

D1. Have the capacity for self-learning in familiar and unfamiliar situations.
D2. Make oral and write presentation of their professional work or scientific inquiry
D3. Instruct technicians and artisans, the basic of Water and Environmental Engineering
D4. Use various communication tools, particularly ICT, in passing on information
D5. Strike the balance between self-reliance and seeking help when necessary in new situations.
D6. Display personal responsibility by working to multiple deadlines in complex activities.
D7. Demonstrate significantly enhanced group working abilities.

5. PROGRAMME STRUCTURE (include modules not bearing credit)

Code	Title and Description of Course	Contact hours	Credit	Level / Semester	Achievement of Level/Programme Outcomes*
ENG 3101	General English	72	0	1/1	D2
SST 3111	Study Skills for Technology	36	10		C5, C6, D2, D5, D7, D1, C7
CIT 3111	International Computer Driving License (ICDL)	36	10		A6, C2, D4
MAT 3111	Engineering Mathematics I	36	10		A1, B1, B2, B3, D1
PHY 3112	Engineering Physics	36	10		A1, A3, B1, C5, C9, D1
CHE 3115	Engineering Chemistry	36	10		A1, A4, B1, D1, C5, C4
MEE 3111	Engineering Drawing & CAD	36	10		A5, B2, B4, C2, C3, D1, D4
	Total L1S1	**288**	**60**		
	Hours/week	**24**			
MAT 3121	Engineering Mathematics II	36	10		A1, B1, B2, B3, D1
EEE 3124	Basics of Electrical and Electronics Engineering	36	10		A1, B2, C5, D1
CIT 3121	Computer Programming	36	10		A1, A6, C2, C8, D4
CEE 3121	Civil Engineering Drawing	36	10		A2, A4, B1, B2, B3, B4, C2, C3, C5, D1, D5
CEE 3121	Engineering Mechanics: Statics & Dynamics	36	10		A4, B2, C5
TWP 3122	Workshop Technology (CE & WEE Group)	48	10		A5, B2, B4, C3, C8, D3
	Total L1 S2	**228**	**60**		
	Hours/week	**19**			
	Total Level 1	**456**	**120**		
ENG 3201	English for Science & Technology	48	0	2/1	D2
MAT 3211	Engineering Mathematics III	36	10		A1, B1, B2, B3, D1
WEE 3211	Appropriate Sanitation Technology	36	10		A2, A4, B1, B2, B3, B6, D3

WEE 3212	Fluid Mechanics	36	10		A2, A3, A4, B1, B2, B4, C5, C6, C8, C9
CEE 3211	Construction Materials	36	10		A1, B1, B2, B4, C8, D1
CEE 3212	Strength of Materials	36	10		A1, B1, B2, B4, C8, D1
CEE 3213	Surveying I	36	10		A2, B1, B2, B6, C2, C3, C5, D1, D3
	Total L2 S1	**264**	**60**		
	Hours/week	**22**			
MAT 3221	Engineering Mathematics IV	36	10		A1, B1, B2, B3, D1
WEE 3221	Engineering Hydrology	36	10		A2, A3, A4, B1, B3, B5, C1, D1
WEE 3222	Open channel hydraulics	36	10		A2, A3, A4, B1, B2, B4, C5, C6, C8, C9
WEE 3223	Environmental Microbiology	36	10		A1, A3, B1, C5, C9, D1
CEE 3222	Engineering Geology	36	10		A6,A7,B5,C5,C7,C8,,D3,D4
CEE 3224	Surveying II	36	10		A1,A5,B2,B3,B6,C1,C4,C6, C7,C8,D2,D3,D4, **D7,D8**
	Total L2 S2	**216**	**60**		
	Hours/week	**18**			
	Total Level 2	**480**	**120**		
ENG 3301	English for Academic Purposes	24	0	3/1	D2
CEE 3314	Soil Mechanics	36	10		A1, A3, B1, B2, C5, C6, D6, D7
WEE 3311	Water Quality Analysis and Treatment	36	10		A2, A4, B1, B2, B3, B4, B5, B6, C1, C3, C9, D1
WEE 3312	Urban drainage and sewerage System	36	10		A2, A3, A4, B1, B2, B3, B4, B5, B6, C1, C3, C9, D1
WEE 3313	Water Supply and Distribution	36	10		A2, A3, A4, B1, B2, B4, B5, B6, C1, C3, C9, D1
WEE 3314	Water resources management	36	10		A2, A3, A4, A5, A6, B1, B2, C1, C2
WEE 3315	Alternative Energy Sources	36	10		A1, B1, B2, B5

	Total L3 S1	**240**	**60**		
	Hours/week	**20**			
	Total Level 3	**240**	**60**		
WEE 3321	Wastewater Treatment	36	10		A2, A4, A6, B1, B2, B3, B4, B5, B7, B8, C1, C3, C9, D1
WEE 3322	Design of Pumping Systems	36	10		A2, A4, B1, B2, B3, B4, C1, C2, C3, C9, D1
WEE 3323	Pollution Control and Waste Management	36	10		A1, A2, A5, B1, B3, B5, B6, B8, C8, D1
WEE 3324	Erosion Control	36	10		A1, A2, A3, A5, B1, B2, B5, B6, B8, C3, D1
WEE 3325	Irrigation and Drainage Engineering	36	10		A2, A3, B1, B2, B3, B5, B6, C1, C3, C8, D4
CEE 3322	Estimating and Costing	36	10		A2, A5, A6, A7, B1, B2, B4, B5, C1, C3, C4, D1, D5
WEE 3330	Industrial Attachment (10 weeks)		20#		A2, B1, C2, C3, C5, C6, C8, D2, D4, D5
	Total L4 S2	**216**	**80**		
	Hours/week	**18**			
	Total Level 4	**216**	**80**		
ESD 3411	Entrepreneurship Development	24	5	5/1	A5, A7, B1, B5, B6, B7, C1, C6, D1, D2
WEE 3411	Groundwater hydraulics	36	10		A2, A3, A4, B1, B3, B5, C1, D1
WEE 3412	Water Systems Modelling	36	10		A1, A6, A7, B1, B2, B6, B8, C2, C8, D4
WEE 3413	Hydropower Engineering	36	10		A1, A3, B1, B5, B6, B7, B8
CEE 3412	Engineering Ethics & Professional Conduct	24	5		A5, A7, B3, B6, B7
WEE 3410	Research Project-I	72	20		B1, B2, B3, B6, C1, C4, C6, C8, C9, D2, D6
	Total L5 S1	**228**	**60**		

	Hours/week	**19**			
WEE 3421	Introduction to Storage and Water Regulation Works	36	10	5/2	A2, A3, A4, B1, B2, B3, B4, B6, C3, C8
WEE 3422	Environmental Management	36	10		A5, A7, B1, B2, B5, B6, B8, C6, D1
CEE 3423	Introduction to GIS and RS	36	10		A1, A6, A7, B1, B2, B6, B8, C2, C8, D4
FIN 3420	Economics & Finance for Engineers	36	10		A5, A7, B7, C4
WEE 3420	Research Project -II	72	20		B1, B2, B3, B6, C1, C4, C6, C8, C9, D2, D6
	Total L5 S2	**216**	**60**		
	Hours/week	**18**			
	Total Level 5	**444**	**120**		
	Total Credit Hours		**500**		

Programme outcomes are to be shown in bold. Most outcomes will be achieved, finally, at Level 5, but some may be achieved earlier in the programme.
+ Nominal hours for Level 5 project
A mapping of Modules and Learning Outcomes is given in a separate sheet
From Academic Year 2011-2012, (form 2009 batch) credits for Industrial Attachment are credited as 20 and credit hours at L5 is 140 as per the approval from KIST Board and was informed thru email by VRA on 15th Dec 2011.This programme will be conducted at the end of Level 4(Yr3SII) and it will be credited in Level 5, Yr4SI.

6. LEARNING AND TEACHING STRATEGY

The basic strategy is to encourage self learning by the student (Learning Objectives, LO D1). This will be achieved by a course in learning skills in the students' first semester, and by ensuring that the contact hours are on average throughout the programme no more than half the notional student learning effort hours of 40 per week (1200 hours over a 30 week year), that is an average of 20 hours per week. In the earlier years it will be a little higher than the average, reducing to the later years to below the average. Thus by the time the student leaves, he/she will be able engage in life long learning. In addition the student will be encouraged to make use of the e-learning environment as it becomes available (also LO D4).

The specific methods include:

- **Lectures**, supported by
    - Problem sheets for the student to solve in their own time.

- Tutorial classes in level 1 to 3, the number per lecture reducing through the levels.
- Staff office hours in Levels 3 to 5, whereby the staff make themselves available at specific times in their office for students to come and ask questions.

(LO's A1 to A4, A5 to A7, B1 to B8, D1)

- **Laboratory Classes.** Their role is to
  - Illustrate lecture material (LO's A1 to A4, B1 to B4)
  - Provide skill in using laboratory equipment and materials and recording data (LO's C2, C5, C9)
  - Analyse data, draw implications, and report the results (LO's A1 to A4, B1, B2, C1, C6, C8, D2)
- **Project Work and Exercises.** These include
  - Essays (LO's A5 to A7, B6 to B8, C7, D2).
  - Small projects or exercises (LO's A1 to A4, B1 to B6, C9, D4)
  - Individual Research Project at Level 5 (LO's B1, B2, B3, B6, C1, C4, C6, C8, C9, D2, D6)
- **Industrial Visits and Placements** (LO's B1, B2, C2, C5, C9, D2, D6)

  The pivotal role of Design is taken from UK-SPEC and the practice in many UK Universities.

7. ASSESSMENT STRATEGY

All assessment will be carried out with reference to marking criteria based on the KIST generic marking criteria. Specific marking criteria will be used for the different assessment types and these will use a matrix of elements and marking criteria where appropriate, such as project work. These marking criteria will be given to students so that they know what the examiners are expecting for a given piece of assessed work.

The maintenance of standards will be achieved by second marking and/or moderation of examinations, continuous assessed work and reports, depending on their nature. This will minimise mistakes or bias by any single examiner. Where possible, examinations and other assessments, level progressions and degree classification will be done anonymously to demonstrate impartiality to all students. In addition the overall assessment process will be subject to external examiner scrutiny who will provide benchmarking to international standards.

The different teaching methods are assessed as follows:

- **Lecture Modules** (those that are delivered mainly by lectures) will be examined primarily by end of semester unseen examinations, but will include an element (up to 40%) of continuous assessment. The latter may be taken from worked problem sheets, laboratory reports, essays or small project exercises. However most of the problem sheets supporting lectures will be formative as also may be some laboratory reports and essays (particularly at the lower levels). Some of the lecture courses may be examined primarily or completely by assignments, where the nature of the course is unsuitable for assessment by examination, e.g. study skills or computer programming. This strategy will contribute to ensuring the achievement of LO's A1 to A7, B1 to B5, D1, D2

- **Design Projects**. These will be examined by a group written report and group presentation. The report and presentation will be constructed so that individual contributions both to the technical work and team working will be identifiable. The assessment will contribute to LO's A1 to A7, B1 to B6, C1 to C9, D1 to D7

- **Survey Lab report:** This will be assessed by students hands on performance in the field by applying the knowledge gained during the course of study and thus contributing the Los: A1,A5,B3,B6,C1,C4,C6,C7,C8, D3,D4, D7,D8

- **Individual Research Project.** This will be assessed by a written report, presentation and oral examination, thus contributing to the LO's A6, A7, B1 to B6, C1 to C9, D1 to D7

- **Industrial Visits and Placements.** These will not normally be assessed summative (they will be formative), but attendance and in some cases a satisfactory report may be required as a condition of progression, LO's B5, B6, B7, B8, C2 to C9, D1 to D7.

The individual module contributions to the Learning Objectives will be specified in each module specification, so that the higher level skills are demonstrated at the higher levels of the degree programme. A curriculum map for Modules and Learning Outcomes also shows the specification.

To guard against cheating, all end-of-semester examinations will be held under strict examination conditions in accordance with University requirements. It is impossible to completely prevent students collaborating on continuously assessed work, and indeed students helping each other is one of the most effective methods of student learning. However students will be made aware at the start of any module to what extent collaboration is desirable, and checks will be made by the relevant staff to ensure that direct copying is minimised. Similarly students will be made aware of what constitutes plagiarism, particularly in respect of essays and the Design Projects (Level 1, 2, 4) and Level 5 Research Project. Presentations and oral examination will help to make plagiarism apparent, but where appropriate, examiners will use other techniques such as internet searching and text comparators.

8. STUDENT PROFILE

As Water and Environmental Engineering is concerned with the application of science, students must have an aptitude for Mathematics and Science and also an interest in creative applications to the design, manufacture and analysis of components, machines and systems.

9. SPECIFIC ADMISSION CRITERIA

Candidates for admission to the Water and Environmental Engineering Programme are expected to satisfy the general admission requirement of the Institute as specified in the academic regulations.

Students will be selected on the basis of their performance in the Rwandan National Examination (A Level) with the option of Science especially **Mathematics-Physics-Biology** or its equivalent for candidates coming outside Rwanda.

10. STRATEGY FOR STUDENT SUPPORT

A group of student will be allocated to a member of staff as a personal tutor. The students will meet with their tutor on a regular basis during Level 1 and Level 2, in a tutor group or as an individual, as appropriate. This will enable the tutor to discover how the student is progressing, and to offer both academic and pastoral support should that be needed. The tutor will discuss with the student the results of any continuous assessed work during the semester, and will review the end of semester examination results with the student at the start of the following semester. In Levels 3 and 4, the meetings will take place less frequently, but at least twice a semester, as the student becomes more mature and independent in the learning process. The supervisor will meet weekly with the student to provide support and guidance through the project work.

Specific subject support will be available to students through the lecture tutorial support and the staff office hours as specified in the Learning and Teaching Strategy. There will be additional pastoral support through the University student support services, which the students will be encouraged to use if necessary.

Provision for students with disabilities will be catered for on an individual basis and with advice from the University student support services. One of the female members of staff will be appointed as the gender discrimination officer for the department (or faculty), and she will address any problems experienced by female students in the area of gender bias, discrimination or harassment.

11. PROGRAMME-SPECIFIC NEED FOR RESOURCES AND UNUSUAL DEMANDS ON UNIVERSITY RESOURCES

At present, the Members of Staff in the Department are sufficient in quantity but in the rank.. There is no shortage of Lecturer except the Course of Engineering Economics and Finance for Engineers. This course will be managed by some visiting/part time lecturers from other Institutions. The department needs a full time Professor to guide the members of staff to their PG studies or PhD studies.

In order to allow at least one laboratory experiment (a minimum) for each lecture course, an urgent refurbishment of the laboratory is required. Nearly all of the present equipment is not working and needs to be repaired, or in some cases replaced. In addition new equipment and increased laboratory space to house them is required. The requirements in laboratories terms of chemicals, reagents, materials, etc

With the growing importance of computers in engineering, a new dedicated laboratory of computers is required to run the Computer Aided Design and Drawing and a full pledged Drawing Hall with all accessories.

Computers for all the staff are required to allow lecturers for each year to use one. Ideally to aid the running of the department and the production of modern teaching materials, a photocopier is also required

To improve the efficiency of teaching and research work, the department is lack of following grades of staff:

- Tutorial Assistant: available in all areas of specialisation
- Lab Technician : 2– these are required not only for running the laboratories, but also for providing support for the significantly increased role of final year projects
- Chief Laboratory Engineer:1 An engineering graduate who will be the overall in charge of all the labs and to take care of machineries and materials
- Secretary or administrator: 1

12. STRATEGIES FOR CONTINUOUS ENHANCEMENT AND FUTURE DEVELOPMENT

At the end of each semester there will be a Module Review meeting of all staff in the department to consider the progress of each module. The module leader will gather information from all staff involved in teaching the module and present these to the meeting. This will be considered along with student feedback on the module and the results of the module assessments.

At the end of the year any views of external examiners will also be considered. Any module which is not going well will be subject to specific measures for improvement. This may involve changes to the content and timing of the module, the methods used for learning and teaching, the assessment methods and standards, and the physical resources required for the module. The effectiveness of these changes will be considered at the Module Review meeting after the next time the module is given.

At the end of the year a Programme Review meeting will consider the curriculum as a whole, regarding its quality and relevance to the needs of the profession and in the light of changes in technology. An Industrial Advisory panel, consisting of a range of professionals and employers in the Water and Environmental Engineering profession, together with some of the senior staff in the department will consider the curriculum and offer suggestions and advice regarding the qualities and skills required of graduating students entering the profession. The Advisory panel will have an input into the Programme Review meeting and will also be asked to advise on any changes being considered to the curriculum.

13. STAFF DEVELOPMENT PRIORITIES

The most urgent priority is the equipping of staff to teach in a radically different manner than previously. The course material will be delivered with up to 35% less contact hours; they should teach so that students are encouraged to undertake self learning, and staff expectations of the students should be raised in terms of the initiative, ideas and confidence expected.

A second important priority will be the development of participation by every staff member in design projects, with at least one staff member with specialist design engineering expertise to lead the new vitally important role of design in raising the standard of the course to an international level.

As stated in Section 11, the Water and Environmental Engineering is critically understaffed, missing several specialisations. Recruitment of some new staff is in progress.

14. ANY OTHER ESSENTIAL INFORMATION

15. PROVISIONAL APPROVAL

Members of Approval Panel

Role/location		Date
1 Chair (VRAC)	Signature	
	Print Name	
2	Signature	
	Print Name	
3	Signature	
	Print Name	
4	Signature	
	Print Name	
5	Signature	
	Print Name	
6	Signature	
	Print Name	
7	Signature	
	Print Name	
8	Signature	
	Print Name	

Seen and noted

Library	Signature	
	Print Name	
ICT	Signature	
	Print Name	
Quality Office	Signature	
	Print Name	
VRAF	Signature	
	Print Name	

Appendix: Curriculum Map

This map shows in a different form the information regarding Modules and Learning Outcomes in the table in Section 5. It shows also how each LO is being met and when it is fully fulfilled

Code	Module Title	A. Knowledge and Understanding							B.Cognitive/Intellectual skills/Application of								C.Communication/ICT/Numeracy/Analytic Techniques									D. General transferable skills						
Level 1, Year 1		A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	C5	C6	C7	C8	C9	D1	D2	D3	D4	D5	D6	D7
ENG 3111 FRE 3111	General English / Français I																										■					
SST 3111	Study Skills for Technology																				■	■	■			■	■			■		
CIT 3111	Computer Driving License						■											■											■			
MAT 3111	Engineering Mathematics I	■							■	■	■															■						
PHY 3111	Engineering Physics	■		■					■												■				■	■						
CHE 3111	Engineering Chemistry	■			■				■												■				■	■						
MEE 3111	Engineering Drawing I					■				■		■						■	■							■			■			
ENG 3121 FRE 3121	General English/ Français II																										■					
MAT 3121	Engineering Mathematics II	■							■	■	■															■						
EEE 3122	Basics of Electrical	■								■											■					■						
CIT 3121	Computer Programming	■					■											■						■					■			
MEE 3121	Engineering Drawing II		■		■				■	■	■	■						■	■					■		■				■		
MEE 3122	Engineering Mechanics				■					■											■											
TWP 3121	Workshop Technology					■				■		■							■					■				■				
Level 2, Year 2		A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	C5	C6	C7	C8	C9	D1	D2	D3	D4	D5	D6	D8
MAT 3211	Engineering Mathematics III	■							■	■	■															■						
WEE 3211	Appropriate Sanitation Technology		■		■				■	■	■			■														■				
WEE 3212	Fluid Mechanics		■	■	■				■	■		■									■	■		■	■							
CEE 3211	Building Materials	■							■			■									■	■		■	■	■						
CEE 3212	Strength of Materials	■							■	■		■												■		■						
CEE 3213	Surveying I		■						■	■				■				■	■		■					■		■				
MAT 3221	Engineering Mathematics IV	■							■	■	■															■						
WEE 3221	Engineering Hydrology		■	■	■				■		■		■				■									■						
WEE 3222	Open channel hydraulics		■	■	■				■	■		■									■	■		■	■							
WEE 3223	Environmental Microbiology	■		■					■												■				■	■						
WEE 3224	Alternative energy sources	■							■	■			■																			
CEE 3224	Surveying II		■						■	■				■				■	■		■					■		■				
CEE 3230	Survey Camp		■						■									■	■		■	■		■			■		■			

Code	Module Title	A. Knowledge and Understanding							B.Cognitive/Intellectual skills/Application of								C.Communication/ICT/Numeracy/Analytic Techniques									D. General transferable skills						
Level 3, Year 3		A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	C5	C6	C7	C8	C9	D1	D2	D3	D4	D5	D6	D8
CEE 3311	Engineering Geology	■							■	■																■						
CEE 3315	Soil Mechanics	■		■					■	■											■	■									■	
WEE 3311	Water Quality Analysis and Treatement		■	■	■				■	■	■	■	■	■		■																
WEE 3312	Urban drainage and sewerage		■	■	■				■	■	■	■	■	■			■		■						■	■						
WEE 3313	Water Supply and Distribution		■	■	■				■	■		■	■	■	■		■		■						■	■						
WEE 3314	Water resources		■	■	■	■	■		■	■							■		■													
Level 4, Year 3		A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	C5	C6	C7	C8	C9	D1	D2	D3	D4	D5	D6	D8
WEE 3221	Wastewater Treatement		■		■		■		■	■	■	■	■		■	■	■		■						■	■						
WEE 3222	Pumping Systems Design		■		■				■	■	■	■					■	■	■	■						■						
WEE 3223	Pollution Control	■	■	■		■			■	■	■		■	■		■			■							■						
WEE 3224	Erosion Control	■	■	■		■			■	■	■		■	■		■			■							■						
WEE 3225	Irrigation and Drainage		■	■					■	■	■	■	■	■			■		■					■					■			
CEE 3322	Estimating and Costing		■			■	■	■	■	■		■	■				■		■	■						■		■		■		
WEE 3330	Industrial Attachment					■		■														■						■		■		■
Level 5, Year 4		A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	B8	C1	C2	C3	C4	C5	C6	C7	C8	C9	D1	D2	D3	D4	D5	D6	D8
ESD 3411	Entrepreneurship Development					■		■	■				■	■	■		■					■				■	■					
WEE 3411	Groundwater hydraulics		■	■	■				■		■		■				■									■						
WEE 3412	Water Systems Modelling	■					■	■	■	■				■		■		■						■					■			
WEE 3413	Environmental Management					■		■	■	■			■	■		■						■				■						
WEE 3414	Hydropower		■	■					■	■			■	■	■	■																
WEE 3430	Research Methodology and Research Project I								■	■	■			■			■			■		■		■	■		■				■	
WEE 3421	Storage and Regulation		■	■	■				■	■	■	■		■					■					■		■						
CEE 3422	Projects Economics & Financial Analysis for					■		■							■					■												
CEE 3423	Introduction to GIS and RS	■					■	■	■	■				■		■		■						■					■			
WEE 3422	Engineering Ethics & Professional Conduct					■		■			■			■	■																	
WEE 3430	Research Project II								■	■	■			■			■			■		■		■	■		■				■	