BACHELOR OF ENGINEERING (HONS) IN CIVIL ENGINEERING (TOP UP) AWARDED BY BIRMINGHAM CITY UNIVERSITY (BCU)

PROGRAMME SPECIFICATION

PROGRAMME PHILOSOPHY AND AIMS

The BCU Civil Engineering degree course prepares students for an exciting and challenging career in the construction industry. By working with our industrial partners and through a rigorous and coherent curriculum focusing on problem-solving, this course aims at developing students' intellectual and practical competence required by the professional bodies such as ICE and IStruct E. After completing this course, the students should have a broad range of knowledge of the technical, managerial, economic, theoretical and environmental aspects of civil engineering in its widest sense, and can confidently apply themselves both to the management and design of civil engineering projects.

With our strong links with the industry we support students by applying their learning to problem-based scenarios. Students are encouraged to develop competencies and skills that are transferrable to the full range of international civil engineering workplace environments.

The programme aims to provide learners with:

- A curriculum that encourages students to seek solutions through problem based learning
- A recognition of the needs of the wider development community
- An ability to design structural elements in various materials
- An understanding of the theories of geotechnics and hydraulics and their application
- An understanding of costing and pricing techniques
- A practical knowledge of topographic surveying and use of instruments
- Knowledge of operational management and the construction process
- Knowledge of civil engineering technology and innovation
- An understanding of construction procurement
- Knowledge and ability to work in teams and lead teams including the aptitude to work independently
- A qualification accredited by the relevant professional bodies
- Knowledge of all the roles in the industry and understanding the importance of being a reflective and innovative professional
- The ability to synthesize complex information and communicate effectively

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Intended learning outcomes and the means by which they are achieved and demonstrated:

Learning Outcomes

1. Knowledge and Understanding

KU1. Scientific principles and theories that underpin civil engineering disciplines;
KU2. Engineering materials and components;
KU3. Design processes and methods;
KU4. Analytical and mathematical modelling techniques used to create solutions to civil engineering problems;
KU5. Computer aided techniques for modelling, simulation and design of civil engineering elements;
KU6. Business, organisational, teamwork and management practices in industries based on civil engineering and the limitations thereof;
KU7. Commercial, ethical, regulatory and environmental factors that influence the choice of solutions to engineering problems

2. Intellectual Skills

IS1. Argue rationally and draw independent conclusions based on a rigorous, analytical and critical approach;
IS2. Critically appraise the usefulness of new technologies and changes in civil engineering practice;
IS3. Design a system, element or network to meet a specification;
IS4. Develop innovative designs and solutions based on a broad range of scientific principles taking into account commercial risks and constraints, intellectual property rights and contractual issues, and environmental impact;
IS5. Apply mathematical and/or computer based modelling to analyse new designs and generate solutions to automotive/mechanical engineering problems;
IS6. Critically appraise the results of mathematical and computer based analyses

3. Practical Skills

PS1. Demonstrate practical engineering skills to use appropriate laboratory and workshop equipment;
PS2. Use computer based systems for modelling and design of civil engineering projects, recognising their limitations and having some awareness of their future development;
PS3. Apply primary and secondary research methods using a wide range of sources of information and appropriate methodologies in the management of engineering projects taking into account of a range of commercial and industrial constraints;
PS4. Apply industry codes of practice and standards

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4. Transferable/Key Skills

TS1. Participate effectively in group working activities in a leadership role being able to undertake most of the technical functions within the group and managing the delivery of a plan under changing circumstances.
TS2. Manage time and prioritise workloads showing high levels of independent learning
TS3. Integrate a wide range of data from a variety of sources to; solve a range of engineering problems, apply understandings to challenging situations and be aware of the limitations of the solution;
TS4. Integrate presentational techniques and the information to be presented for maximum effect;
TS5. Access and make appropriate use of numerical and statistical information and develop a deeper understanding and/or greater impact
TS6. Make effective use of information and communications technologies, including word and data processing packages, the internet and electronic information retrieval systems;
TS7. Research and use new methods required for novel situations and adapt to specific purposes if required

Learning teaching, and assessment methods used

1. Knowledge and understanding

Knowledge and understanding are acquired through formal lectures including presentations, seminars, tutorials, hands-on experience, learning sets and problem based scenarios, backed up by guest speakers, visits to construction sites, manufacturers and exhibitions when appropriate. High emphasis is given to student directed and student centred learning.

Knowledge and understanding is assessed formatively by work based learning and problem solving, in-class tasks, seminar work, peer assessment and learning sets.

Summative assessment is by way of assignments, projects, presentations, time-controlled assignments and end examinations, where appropriate to the unit.

Assessment criteria defined for a Pass are described within the module documents, clearly defined criteria for grades are issued with the assessment tasks.

2. Intellectual skills

Use of real and scenario based case studies, self-directed learning facilitated by, problem-based learning scenarios and surveying, design, construction, budget, health & safety and management projects based upon a real project and its inherent problems.

Assessment includes, seminar and tutorial work, assignments, time controlled tasks, work based evidence and end of unit examination.

3. Practical skills

Practical demonstration work, seminar, laboratory and tutorial work, use of ICT as a visual tool, problem-based scenarios and group project work.

Students are encouraged to plan their own work schedules, manage their time and extend their presentational skills in the application of their learning as they should be doing when working in industry.

Assessment methods include the use of ICT to demonstrate hands-on experience, formal drawing techniques, practical surveying exercises and group project work.

Formative assessment of peers through reviewing work in teamwork, written articles for reflection in learning sets or presentations.

Self evaluation of learning styles will be conducted through the course induction programme when reviewing the university electronic Moodle web pages.

Self appraisal of performance and the production of a Personal Development Plan which is produced at the induction stage of the course and reviewed within the second year so as to evaluate the student's present and life long learning strategy.

4. Transferable/key skills

Examples of teaching and learning strategies include: lectures, seminars and tutorials, self-directed learning facilitated by study packs and, where appropriate, the use of work based learning and research-based teaching materials and methods, also problem-based learning scenarios in small teams and larger groups.

Communication, team building skills, ICT and professional awareness within the industry are paramount to all subjects and will be demonstrated by the student within the framework of the course and across all subjects being studied.

Transferable/key skills are generally incorporated within the units and are related to various assessments as appropriate.

Whole school modules are used to provide realistic projects through which these skills can be demonstrated, particularly through team working with students studying other construction professions.

Production of evidence includes seminars, learning sets, group work and presentations. This evidence may be compiled through the subjects being studied or through work-based learning in the main, but is not restricted to these alone.

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PROGRAMME SYNOPSIS

Module 1: Advanced Analysis and Design Methods (20 Credits)

This module has been designed to enable student to use problem-based learning to understand the materials now being used in Civil Engineering and the innovative ways they are being applied. It helps student to understand how test results can help to assess materials and to improve the sustainability of civil engineering projects.

Student will learn through formal lectures including presentations, seminars, tutorials, hands-on experience, learning sets and problem-based scenario, backed up by guest speakers when appropriate. Learning activities incorporate formative assessment including work-related learning and problem solving, in-class tasks, seminar work and learning sets.

Practical work within this module includes practical demonstrations, seminar, laboratory and tutorial work, use of ICA as a visual tool, problem-based scenarios and group work.

Module 2: Geotechnical Engineering (20 Credits)

This module explores theories of geotechnics and their application to design and construction of civil engineering projects. It will enhance the student knowledge and ability to work in and lead teams, including the aptitude to work independently and understand the importance of being a reflective and innovative professional.

Student will learn through formal lectures including presentations, seminars, tutorials, hands-on experience, learning sets and problem-based scenarios, backed up by visits to exhibitions when appropriate. Learning activities will incorporate work-related learning and problem solving, in-class tasks and seminar work.

Practical work includes practical demonstrations, seminars, laboratory and tutorial work, use of ICT as a visual tool, problem-based scenarios and group projects.

Module 3: Hydraulics and Drainage (20 Credits)

This module uses problem-based learning to understand the theories and applications of hydraulics in civil engineering, including flow of fluids and theories relating to pumps, many demonstrated through laboratory experiments. Theories are then practically applied to drainage system design.

Students will learn through formal lectures including presentations, seminars, tutorials, hands-on experience, learning sets and problem-based scenarios. Learning activities will incorporate work-related learning and problem solving, in-class tasks, seminar work and learning sets.

Practical work includes demonstrations, seminars, laboratory and tutorial work, use of ICA as a visual tool and problem-based scenarios.

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Module 4: Structures II (20 Credits)

This module enables student to understand Structural Design and relate it to information learned in previous modules. Student will learn through formal lectures including presentations, seminars, tutorials and problem -based scenarios, backed up by visits to construction sites when appropriate. Learning is practice-based and knowledge applied, and incorporates project-based activities. International design methods are utilised and theories applied to such locations.

Learning activities will incorporate problem solving, in-class tasks, seminar work and learning sets. Practical work within this module includes use of ICT as a visual tool, problem-based scenarios and group work.

Module 5: Individual Honours Project (40 Credits)

This module enables student to undertake a sustained, in-depth and research-informed project exploring an area of personal interest to the student. In agreement with his/her supervisor, the students will decide on the topic, which will take the form of a practical outcome (artefact) with accompanying contextual material.

The topic must align to the programme the student is studying and he/she should consider the relevance of this topic to his/her future academic or professional development. At this level, student will be expected to work independently but he/she will receive additional one-to-one support from his/her supervisor, who will be familiar with the chosen topic area. As student progress on the module, extra support will be available and this may take the form of group seminars, workshops and online materials that will help to develop the project.

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