SUMMER PROGRAMMES

UNDERGRADUATE MODULE SYLLABUS

GENERAL INFORMATION	
Module title	Biomedical Engineering Summer Research Module
Module code	4ZSS0177
Module level	Level 6 (advanced Undergraduate equivalent)
Credit value	Equivalent to 30 King's credits, 15 ECTS, 6 US Credits
Duration	6 Weeks
Workload	32 contact teaching hours + 268 independent study hours. (See detail below)
Entry Requirements	In addition to the standard Undergraduate Summer School entry requirements, applicants must: • Submit a personal statement identifying their chosen research project and explaining their reasons for undertaking the Biomedical Engineering Summer Research Module. • Have completed at least two years of undergraduate study in a relevant discipline, such as mathematics, physics, engineering, science or medicine.
Mode of Delivery	Face to face, on campus
Contributing Faculty	School of Biomedical Engineering and Imaging Sciences
Date last updated	Oct. 2026

MODULE INFORMATION

Module description

The Biomedical Engineering Summer Research Module offers Undergraduate students the opportunity to undertake an academic research project within the School of Biomedical Engineering and Imaging Sciences at King's College London. The School develops engineering and imaging technologies to address clinical challenges and improve patient care, working closely with clinicians and researchers.

During the six-week programme, students join an established research group based at St Thomas' Hospital and contribute to a project aligned with the School's current research activities. Working with an experienced academic supervisor, they develop an understanding of the research problem, plan and undertake appropriate investigations, analyse findings and communicate their work through scientific writing and oral presentation.

The module emphasises active participation in a research environment, independent problem-solving, responsible research practice and the development of transferable skills relevant to postgraduate study and research careers. The exact research topic and methods depend on the allocated project.

Educational aims

This module aims to:

- Provide practical experience of undertaking an academic research project within a research-intensive university.
- Develop understanding of scientific research methodologies and their application to biomedical engineering and healthcare challenges.
- Develop skills in planning, conducting, analysing and communicating scientific research.
- Encourage independent learning, critical thinking and problem-solving through participation in an active research group.
- Provide a foundation for further academic study and potential careers in research and development.

Learning outcomes

By the end of this module students will be able to:

1. Critically evaluate scientific literature relevant to a biomedical engineering research problem, identifying existing knowledge and opportunities for investigation.

2. Design and implement an appropriate research strategy, selecting suitable experimental or analytical methods for a defined research question.

3. Collect, analyse and interpret research data using appropriate techniques, evaluating the reliability and limitations of the findings.

4. Evaluate research outcomes in relation to existing scientific knowledge and their potential application to biomedical engineering and healthcare.

5. Communicate scientific research effectively in a structured scientific paper and oral presentation, using appropriate academic conventions.

Teaching, Learning, and Research Activity

Research project and module content

The module centres on an individual project aligned with the School's current research. Projects address biomedical engineering or healthcare technology challenges and may involve the design, development, testing or evaluation of approaches to unmet clinical needs. Depending on the project, students may engage in laboratory investigations, computational modelling, medical imaging, experimental design, data analysis, prototype development or technology evaluation.

Core research activities include understanding the research context; reviewing relevant scientific literature; defining project objectives; planning methods and milestones; conducting experimental or analytical work; interpreting data; and preparing research outputs. The exact activities are agreed with the supervisor and depend on project feasibility, equipment and research requirements.

Teaching and learning approach

Teaching is primarily through supervised research and independent project work rather than conventional lectures. Students are expected to commit at least 35 hours per week to their project over the six weeks. Their schedule is shaped by research needs, with structured supervision, seminars and research group activities forming part of the overall experience.

- Independent research and project work: carrying out practical and analytical activities, planning investigations, evaluating results and preparing research outputs.
- Research skills seminars: developing scientific writing and other transferable research skills relevant to the project.
- Research group participation: joining appropriate laboratory activities, meetings and discussions with researchers.
- Independent study: critical reading, analysis, reflection, writing and preparation for presentation.

Research supervision

Each student is allocated an academic research supervisor who provides guidance on the research question, methodology, progress and dissemination of findings. Regular supervision meetings support the setting and review of achievable objectives. Students may also receive day-to-day guidance from members of the host research group and should seek clarification promptly when needed.

Student engagement and responsibilities

Students are expected to take ownership of their projects, demonstrate initiative and organise their research activities in consultation with their supervisor. They should contribute constructively to the host group, attend scheduled activities, prepare for supervision meetings, follow laboratory and institutional safety procedures, and maintain professional and ethical research practice.

Indicative six-week programme structure

The following progression is indicative only. Research activity may begin in the first week and will vary according to the allocated project and host group.

Period	Indicative activities
Week 1	Research group induction; project context and objectives; research planning; initial practical work.
Week 2	Development of methods and technical skills; experimental or analytical work.
Week 3	Continued research; data collection and initial analysis.
Week 4	Further investigation and analysis; review of progress and emerging findings.
Week 5	Consolidation and interpretation of results; preparation of research outputs.
Week 6	Finalisation of scientific paper; oral presentation and reflection on findings.

Teaching methods

The programme requires a minimum of 35 hours per week, approximately 210 hours across six weeks. The breakdown below illustrates activities described in the earlier programme syllabus; it is not a separately confirmed timetable or a statement of additional hours beyond the 210-hour commitment.

Research Supervision meetings	Research Skills Seminars	Research Group Meetings	Introduction and Final Presentation	Project-based research, analysis, independent study and writing
12	10	6	4	268

Assessment

Literature Review

Students critically review scientific literature relevant to their allocated project, demonstrating understanding of the research context, current knowledge and the significance of the research problem. The timing and detailed submission requirements will be communicated by the programme team.

Scientific Paper

Students prepare a scientific paper reporting their project. It should present the research aims and context, explain and justify the methodology, communicate results clearly, critically discuss their significance and limitations, and draw conclusions supported by the findings. Appropriate scientific conventions, figures, tables and references should be used.

Oral Presentation

Students present their research to an academic audience, summarising the research question, methods, principal findings and conclusions. They should communicate technical content clearly and respond to questions or discussion about their work.

Method	Number	Duration/length	Pass mark	% of final grade of module
Literature Review	1	1500 words	40%	20%
Scientific Paper	1	10 page in IEEE TBME style	40%	60%
Oral Presentation	1	5 mins	40%	20%

Attendance requirements

Students must attend a minimum of 80% of timetabled contact hours to receive a Record of Agreed Results. Students are also expected to participate fully in agreed laboratory and research activities, supervision meetings and seminars, and to comply with relevant research ethics, academic integrity and health and safety requirements.

Reading list