# TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

## COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

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| 1. Teaching Institution | Baghdad University- Al-Khwarizmi College of Engineering |
| 2. University Department/Centre | Biomedical Engineering |
| 3. Course title/code | Engineering Systems |
| 4. Programme(s) to which it contributes | BSc in Biomedical Engineering |
| 5. Modes of Attendance offered | Full time attendance |
| 6. Semester/Year | One Semesters per year |
| 7. Number of hours tuition (total) | 45 hours in the semester |
| 8. Date of production/revision of this specification | |
| 9. Aims of the Course | |
| By the end of this course, the students will be able to understand the dynamic characteristic of many mechanisms that are used in different biomedical applications. Such applications are dentures, bone fixation, and exoskeleton. The student knowledge will be honed by writing technical reports and demonstrating oral presentations. | |

| 10· Learning Outcomes, Teaching ,Learning and Assessment Methods |
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| A- Knowledge and Understanding<br><br>A1.<br>A2.<br>A3. |
| B. Subject-specific skills<br>B1.<br>B2.<br>B3. |
| Teaching and Learning Methods |
| • Lectures where the students write information presented to them via slide show, overhead or written by the lecturer;<br>• Lectures where the students have some printed notes/handouts and may annotate, or expand these during a spoken lecture;<br>• Question and answer sessions during lectures or staff Office Hours;<br>• Laboratory sessions. |
| Assessment methods |
| • Written examinations (Summative assessment);<br>• Oral presentations of individual and group work;<br>• Homework;<br>• Practical skills will be assessed through laboratory experiments, write-ups, coursework reports, project reports and presentations;<br>• Presentation skills through group presentations and poster presentations. |
| C. Thinking Skills<br>C1.<br>C2.<br>C3.<br>C4. |
| Teaching and Learning Methods |
| External lectures from industry or clinicians;<br>• Feedback given to students during tutorials;<br>• Question and answer sessions during lectures or staff Office Hours;<br>• Completion of web-based exercises or computer based laboratory sessions; |

| Assessment methods |
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| Individual written project report(s) of both individual and group projects;<br>• Practical skills will be assessed through laboratory experiments, write-ups, coursework reports, project reports and presentations;<br>• Presentation skills through group presentations and poster presentations. |

| D. General and Transferable Skills (other skills relevant to employability and personal development)<br><br>D1.<br>D2. |
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| Teaching and Learning Methods |
| • Lectures where the students have some printed notes/handouts and may annotate, or expand these during a spoken lecture;<br>• Lecture material placed on web-pages or other e-learning environment;<br>• External lectures from industry or clinicians;<br>• Question and answer sessions during lectures or staff Office Hours; |
| Assessment Methods |
| • Practical skills will be assessed through laboratory experiments, write-ups, coursework reports, project reports and presentations;<br>• Presentation skills through group presentations and poster presentations. |

| 11. Course Structure | | | | | |
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| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching Method | Assessment Method |

| Week | Date | Topes Covered | Teaching Method | Notes |
|---|---|---|---|---|
| 1 | | Dynamic systems | Oral presentation | |
| 2 | | - Mechanism<br>Relative and absolute velocity<br>Relative and absolute acceleration<br>- Define redial and tangential velocity<br>- Define redial and tangential acceleration | | |
| 3 | | - Describe a mechanism of two and three bar chain<br>- Solve the velocity and acceleration of points within a mechanism<br>- Use mathematical and graphical methods | | Quiz 1 |
| 4 | | - Construct velocity and acceleration diagram<br>- Inertia force<br>- Define corioils<br>- Solve problem involving sliding links<br>Application on human body system | | |
| 5 | | Fatigue failure due to variable stress<br>- Variable stresses in machine parts<br>- Completely Reversed or cyclic stresses<br>- Fatigue and endurance limit | | |
| 6 | | - Approximation of S-N curve of high cycle fatigue<br>- Solve problem | | |
| 7 | | Applications of fatigue on human | | |

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| | | body system and on biomedical materials | | |
| **8** | | Creep failure due to constant stress and temperature<br>- Introduction<br>- Creep strain – Time diagram<br>- Parameter method<br>- Stress relaxation<br>- Solve problem | | Quiz 2 |
| **9** | | Creep Applications on Biomedical materials and chemical system | | |
| **10** | | Mid-term Exam | | |
| **11** | | Screwed joints system<br>- Screwed joints | | Quiz 3 |
| **12** | | Application on dental implants | Seminar | |
| **13** | | riveted joints system<br>- Riveted joints (methods of riveting, Lab joints, Butt joint) | Seminar | |
| **14** | | Application on bone joints | Seminar | |
| **15** | | Seminar | | |

| 13. Admissions | |
|---|---|
| 12. Infrastructure | |
| Required reading:<br>· CORE TEXTS<br>· COURSE MATERIALS<br>· OTHER | 1-Biomedical Signal Analysis: A Case-Study Approach [Hardcover], By: R. M. Rangayyan, 1st Edition.<br><br>2-Practical Biomedical Signal Analysis Using MATLAB (Series in Medical Physics and Biomedical Engineering) [Hardcover], By: K. J. Blinowska (Author), J. Zygierewicz (Author)<br><br>3-Hwei P. HSU" Signals and System". (Shaum's outlines |
| Special requirements (include for example workshops, periodicals, IT software, websites) | **MATLAB software package** |
| Community-based facilities (include for example, guest Lectures , internship , field studies) | |
| Pre-requisites | **DSP** |
| Minimum number of students | **10** |
| Maximum number of students | **40** |