<table>
<tr><td>New Course Code and Title</td><td colspan="2">BG6002 Advanced Biomechanics</td></tr>
<tr><td rowspan="3">Details of Course</td><td colspan="2">Summary of course content (please note that this information provided will also be uploaded to the web for viewing at large)

This course applies the methods of mechanics to biomechanical phenomena from molecular to tissue level. The topics covered in the course include:

1) Continuum Mechanics
Basic mechanics Concepts; Vectors, Matrices and Tensors; Stress; Analysis of Strain; Viscoelasticity.

2) Molecular Mechanics
Elasticity Models of Macromolecules; Cooperativity and Phase Transitions.

3) Cellular Mechanics
Biological membranes; Cytoskeleton; Cell Adhesion, Migration and Aggregation; Mechanotransduction.

4) Mechanics of Tissues (optional topic)
Elastic, visco-elastic and poro-elastic behavior of tissues; continuum and micro structural models.</td></tr>
<tr><td colspan="2">Rationale for introducing this course
This course will be imparted to postgraduate students who come from diverse backgrounds and different universities, a solid foundation in and broad understanding of bioengineering fundamentals and prepare them to conduct their research with greater efficiency.</td></tr>
<tr><td colspan="2">Aims and objectives
The objective of the course is to provide students with a solid foundation on cellular and molecular biomechanics. The course will cover fundamental concepts in solid mechanics, including elasticity and viscoelasticity, with emphasis on applications to biological systems.</td></tr>
<tr><td>Assessment</td><td>Example
Final Examination:
Homework
Term Paper</td><td>
50%
25%
25%</td></tr>
<tr><td></td><td>Total:</td><td>100 %</td></tr>
<tr><td>To be offered with effect from
(state Academic Year and Semester)</td><td colspan="2">AY 2011/2012 S2</td></tr>
<tr><td>Cross Listing (if applicable)</td><td colspan="2"></td></tr>
<tr><td>Prerequisites (if applicable)</td><td colspan="2">Proficiency in calculus and basic physical principles.</td></tr>
<tr><td>Preclusions (if applicable)</td><td colspan="2"></td></tr>
<tr><td>Mode of Teaching & Learning
(Lectures, regular tests, Q&A, problem-based learning)</td><td colspan="2">Lectures and reading assignments</td></tr>
</table>

Basic Reading List • **Compulsory Reading** • **Supplementary Reading**	Journal articles that will be provided by the instructors. 1. Fung, Y.C. *First Course in Continuum Mechanics,* Prentice Hall*, 1993* 2. Boal, David H. *Mechanics of the Cell*. New York, NY: Cambridge University Press, 2002. 3. Fung, Y. C. *Biomechanics: Mechanical Properties of Living Tissues*. 2nd ed. New York, NY: Springer-Verlag, 1993.	
Maximum Class Size	*30*	
Hours of Contact/Academic Units	*Example* *39 hours / 3 AU*	
Workload Per Week (The workload for a 3-AU course must add up to 39 hours of contact hours)	Lecture hours per week Tutorial hours per week Laboratory hours per week No. of hours per week for projects, fieldwork, Assignments, reading, etc.	2 1 3
	Total hours per week	6