Computational Environmental & Global Changes Course Specifications

Faculty: Computer and Informatics
Department: Scientific Computing

Program(s) on which the course is given	**:**	Bachelor in Computer & Information Sciences
Major or Minor element of programs	**:**	Scientific Computing
Department offering the program	**:**	Scientific Computing
Department offering the course	**:**	Scientific Computing
Academic year / Level	**:**	4th Year / B.Sc.
Date of specification approval	**:**	15/3/2010

A. Basic Information

Title: Computational Environmental & Global Changes **Code:** SCC 438

Lecture: 3 hrs/week **Tutorial:** 2 hrs/week **Practical:** ---

Credit Hours: --- **Total:** 5 hrs/week

B. Professional Information

1. Overall Aims of Course:

This course introduces students to computational geometry. Upon completion of this course, students will have Good-knowledge of computational geometry topics like Line-segment intersection, segment-segment intersection, Voronoi diagram, Delaunay triangulation, Motion Planning, etc. Graduates will also be able to design efficient algorithms for topics in

computational geometry.

2. Intended Learning Outcomes of Course (ILOs):

a- Knowledge and Understanding:

a1- Illustrate Basics of Computational Geometry.

a2- Explain Line segment intersection.

a3- Name Segment-segment-segment intersection.

a4- State Visibility graph.

a5- State Voronoi-Diagrams.

a6- State Delaunay triangulations.

a7- Explain Motion planning.

b- Intellectual Skills:

b1- Implement Geometrical problems.

b2- Build and plan an efficient algorithm for the given problem.

b3- Conclude and make proof of the theories using systematic steps.

b4- Integrate application of the geometrical algorithms in other scientific area.

c- Professional and Practical Skills:

Knowledge of the concepts and material presented in this course will provide the students with practical know-how to:

c1- Design an effective algorithm for the geometrical problem.

c2- Write effective computer programs for the geometrical algorithm.

d- General and Transferable Skills:

Knowledge of the concepts and material presented in the course will provide the students with the capability to:

d1- Understand and present the geometrical problem and how to deal with it as a data to be processed.

d2- Write and discuss effective computer programs that employ efficient algorithms.

d3- Analyze and design algorithms for solving scientific problems related to other disciplines.

e. Attitude:

e1- Learn how to make relation with other, and the limit of this relation.

e2- Demonstrate an ethical behavior toward software copyrights

e3- Explain the nature of privacy and how it is protected by the Data Protection

3. Contents:

Topic	No. of hours	Lecture	Tutorial/ Practical
An introduction to the global system interactions responsible for global environment change. Concepts for providing a global description of the earth system. (Part I)	**5**	**3**	**2**
An introduction to the global system interactions responsible for global environment change. Concepts for providing a global description of the earth system. (Part II)	**5**	**3**	**2**
An introduction to the global system interactions responsible for global environment change. Concepts for providing a global description of the earth system. (Part III)	**5**	**3**	**2**
Basic environmental processes influencing global change. Natural causes of past and present global changes.(Part I)	**5**	**3**	**2**
Basic environmental processes influencing global change. Natural causes of past and present global changes. (Part II)	**5**	**3**	**2**
Basic environmental processes influencing global change. Natural causes of past and present global changes. (Part III)	**5**	**3**	**2**
Human consequences of global system changes. Climate and hydrological systems. Global warming.	**5**	**3**	**2**

Deforestation. Ozone depletion. Ecological system dynamics. (Part I)			
Human consequences of global system changes. Climate and hydrological systems. Global warming. Deforestation. Ozone depletion. Ecological system dynamics. (Part II)	**5**	**3**	**2**
Human consequences of global system changes. Climate and hydrological systems. Global warming. Deforestation. Ozone depletion. Ecological system dynamics. (Part III)	**5**	**3**	**2**
Human consequences of global system changes. Climate and hydrological systems. Global warming. Deforestation. Ozone depletion. Ecological system dynamics. (Part IV)	**5**	**3**	**2**
Introduction to climate and global change monitoring. Satellite instrumentation and calibration. Model predictions. (Part I)	**5**	**3**	**2**
Introduction to climate and global change monitoring. Satellite instrumentation and calibration. Model predictions. (Part II)	**5**	**3**	**2**
Introduction to climate and global change monitoring. Satellite instrumentation and calibration. Model predictions. (Part III)	**5**	**3**	**2**
Introduction to climate and global change monitoring. Satellite instrumentation and calibration. Model predictions. (Part IV)	**5**	**3**	**2**