

MAEG 5030: Geometric Computing for Design and Manufacturing

1st Term 2019-2020

Course Objectives:

1. Understand the fundamentals of various geometric modeling and processing techniques used in design and manufacturing systems
2. Understand the fundamentals of the computing tools used for developing geometric modeling, processing and planning based applications
3. Understand the process for developing geometric modeling and processing systems

Course Teacher: Professor Charlie C. L. Wang, ERB209, cwang@mae.cuhk.edu.hk

Tutor: QIN Mian, mqin@maecuhk.onmicrosoft.com

Lecture Schedule:

Monday (11:30am-12:15pm), LSB LT2

Wednesday (04:30pm-06:15pm), ERB LT

Office hours: Monday (4:30pm-5:30pm), ERB 209, William M. W. Wong Engineering Building

Textbook: No specific one.

Grading:

- Assignments (Programming and Implementation): 40%
- Course Project: 30%
- Final Examination: 30%

Assessment Criteria

Due days for problem sets will be specified. Problem sets will carry a 50% penalty if handed in late. No credit will be given to problem sets that are late for more than three days. Copying or plagiarism is strictly prohibited. (See Honesty in Academic Work at <http://www.cuhk.edu.hk/policy/academichonesty/>)

Examination

No make-up examination is allowed unless approval from the Registrar for absence is presented. If not permitted, a zero grade in that examination will be given. (See Undergraduate Student Handbook Regulations and examinations, as well as Honesty in Academic Work)

Syllabus (Tentative):

Weeks	Data	Topic	Lab / Tutorial	Deadlines
1	02/09 & 04/09	L1 - Introduction		Add /Drop Period
2	09/09 & 11/09	L2 - 3D Data Acquisition		
3	16/09 & 18/09	L3 - Point Cloud Processing	Computer Lab 1	
4	23/09 & 25/09	L4 - Direct Surface Reconstruction		Assignment 1 (Friday 11:59pm)
5	30/09 & 02/10	L5 - Polynomial/Spline Curves		
6	07/10	L5 - Polynomial/Spline Curves	Computer Lab 2	
7	14/10 & 16/10	L6 - Differential Geometry for Curves		Assignment 2 (Friday 11:59pm)
8	21/10 & 23/10	L7 - Polynomial/Spline Surfaces		
9	28/10 & 30/10	L8 - Differential Geometry for Surfaces	Tutorial 1	
10	04/11 & 06/11	L9 - Implicit Surface Reconstruction		Assignment 3 (Friday 11:59pm)
11	11/11 & 13/11	L10 - Layered Depth-Normal Images		
12	18/11 & 20/11	L11 - GPU-based Solid Modeling for Manufacturing	Tutorial 2	
13	25/11 & 27/11	L12 - Generative Design		Assignment 4 (Friday 11:59pm)
14	02/12	L13 - Computational Fabrication		
15	TBD	Final Examination		Project Report (Friday 11:59pm)