

Ewha Graduate School  
**Course Syllabus**  
 2017 Spring Semester

<u>Course Title: Scientific Computing</u>	<u>Course ID: G10523</u>
<u>Class Hour: Mon 5/6 (2:00-)</u>	<u>Class Room: SciComplx A-315</u>
<u>Instructor: June-Yub Lee</u>	<u><a href="http://math.ewha.ac.kr/~jylee">http://math.ewha.ac.kr/~jylee</a></u>
<u>Office: SciComplx A-324(3277-3451)</u>	<u>Office Hour: Mon 11~, Thur 1~</u>

### 1. Objective

We try to develop computational models for various problems in mathematics, sciences, and engineering. We study numerical methods and programming tools to get the computational results of such problems.

### 2. References

- Walter Gander, Jiri Hrebicek, Solving Problems in Scientific Computing using Maple and Matlab*, 2nd Ed, Springer. (4th/2004)
- Ke Chen, Peter Giblin, Alan Irving, Mathematical explorations with Matlab*, Cambridge University Press, 1999.
- Richard E. Crandall, Projects in scientific computation*, Springer-Verlag, The Electronic Library of Science(TELOS), New York, 1994
- Stenen Koonin, Computational Physics*, The Benjamin/Cummings Pub.

### 3. Assignment and evaluation

- **Homework** : Programming in any language (Matlab, Fortran, C/C++)
- **Computational Project** : A report with program and documentation
- **Final Project** : Individual (or team) project of your own choice

### 4. Weekly Schedule

Week	Chapter	Subject	Text	
1-3	1. The Tractrix and Similar Curves	Ordinary differential equation	1-14	
4-5	3. The Illumination Problem	Numerical differentiation and optimization	25-36	
6-7	5. The Internal Field in Semiconductors	2nd order elliptic partial differential equation	59-68	
10-11	6. Some Least Squares Problems	Least square method	69-87	
12-13	9. Smoothing Filters	Denoising signals	121-140	
14-16	Final Presentation	Individual Projects		