
ROCHESTER INSTITUTE OF TECHNOLOGY

COLLEGE OF SCIENCE
CHESTER F. CARLSON CENTER FOR IMAGING SCIENCE

COS-IMGS-609 Graduate Laboratory 1

1.0 Course Information

a) Catalog Listing (click [HERE](#) for credit hour assignment guidance)

Course title (100 characters)	Graduate Laboratory 1
Transcript title (30 Characters)	Graduate Laboratory 1
Credit hours	2
Prerequisite(s)**	Graduate standing in Imaging Science or permission of the instructor.
Co-requisite(s)	

b) Terms(s) offered (check at least one)

<input checked="" type="checkbox"/>	Fall
<input type="checkbox"/>	Spring
<input type="checkbox"/>	Summer
<input type="checkbox"/>	Other
<input type="checkbox"/>	Offered biennially

If "Other" is checked, explain:

c) Instructional Modes (click [HERE](#) for credit hour assignment guidance)

	Contact hours	Maximum students/section
Classroom	2	30
Lab		
Studio		
Other (specify, i.e. online, workshop seminar, etc.)		

2.0 Course Description (as it will appear in the bulletin)

This laboratory course is intended to familiarize graduate students with many concepts, tools, and techniques necessary for completion of the Imaging Science graduate curriculum. Students will work in a variety of areas including scientific programming, numerical analysis, imaging system analysis, and characterization. (Pre-requisite: Graduate standing in Imaging Science or permission of the instructor.)

3.0 Goal(s) of the Course

To familiarize students with fundamental concepts, tools, and techniques necessary for completion of the Imaging Science graduate curriculum

4.0 Intended course learning outcomes and associated assessment methods

Include as many course-specific outcomes as appropriate, one outcome and assessment method per row. Click [HERE](#) for guidance on developing course learning outcomes and associated assessment techniques.

Course Learning Outcome	Assessment Method
4.1 Develop basic understanding of scientific programming; understanding and implementation of various numerical analysis techniques	Homework, projects
4.2 Develop understanding of end to end image system analysis and characterization	Homework, laboratory experiments

5.0 Topics (should be in an enumerated list or outline format)

- 5.1 Introduction to Scientific Programming
- 5.2 Advanced mathematics
- 5.3 Numerical Analysis
- 5.4 Image System Characterization
- 5.5 Image System Performance Measurement

6.0 Possible Resources (should be in an enumerated list or outline format)

- 6.1 Numerical Recipes, Press et al., (<http://numerical.recipes>)
- 6.2 Introduction to Probability, Statistics and Random Processes, Hossein Pishro-Nik (www.probabilitycourse.com)
- 6.3 Probability, Statistical Optics, and Data Testing, 3rd Edition, B.R. Frieden, Springer, 2001.
- 6.4 Experimental Design and Analysis, H.J. Seltman, 2015 (www.stat.cmu.edu/~hseltman)
- 6.5 Multivariable Mathematics: Linear Algebra, Calculus, Differential Equations, 2nd Edition, R. E. Williamson, H. F. Trotter,
- 6.6 Linear Algebra and Its Applications, 4th Edition, G. Strang,
- 6.7 Differential Equations and Linear Algebra, (2014), G. Strang,

7.0 Program outcomes and/or goals supported by this course (if applicable, as an enumerated list)

7.1 This course will provide students with many tools and concepts required to complete the imaging science graduate curriculum. It will provide a common background for our diverse incoming graduate student body.

7.2 This course will provide students with a common computational toolbox of techniques and code that will be utilized throughout the Imaging Science graduate curriculum.

7.3 This course will provide students with background material in image system design, setup, and experiment characterization

8.0 Administrative Information

a) Proposal and Approval

Course proposed by	David Messinger
Effective term	Fall 2018
Required approval	Approval granted date
Academic Unit Curriculum Committee	
Department Chair/Director/Head	
College Curriculum Committee	
College Dean	

b) Special designations for undergraduate courses

The appropriate Appendix (A, B and/or C) must be completed for each designation requested. IF YOU ARE NOT SEEKING SPECIAL COURSE DESIGNATION, DELETE THE ATTACHED APPENDICES BEFORE PROCEEDING WITH REVIEW AND APPROVAL PROCESSES.

Check	Optional Designations	*** Approval date (by GEC, IWC or Honors)
	General Education	
	Writing Intensive	
	Honors	

c) This outline is for a...

<input type="checkbox"/>	New course
<input checked="" type="checkbox"/>	Revised course
<input type="checkbox"/>	Deactivated course

If revised course, check all that have changed

	Course title		Mode of Delivery
<input checked="" type="checkbox"/>	Credit hour	<input checked="" type="checkbox"/>	Course Description
	Prerequisites		Special Designation
	Contact hour		
	Other (explain briefly): offered as special topics course S1415, F1718		

d) Additional course information (check all that apply)

<input type="checkbox"/>	Schedule Final Exam
<input type="checkbox"/>	Repeatable for Credit How many times: 4x
<input type="checkbox"/>	Allow Multiple Enrollments in a Term
<input checked="" type="checkbox"/>	Required course For which programs: Imaging Science Ph.D.
<input type="checkbox"/>	Program elective course For which programs: Imaging Science

e) Other relevant scheduling information

(e.g., special classroom, studio, or lab needs, special scheduling, media requirements)

9.0 Colleges may add additional information here if necessary
(e.g., information required by accrediting bodies)