Finding Your Way through Physics at Rensselaer

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What do our Physics majors do when they graduate?

- Survey of ~200 graduates: ~1/3 Physics + Astro grad, ~1/3 Other grad, ~1/3 employment
- Other grad – 2 law, 2 med, 1 film school, 2 medical physics, 3 teacher cert, 1 educational physics
Best graduate program ranking vs GPA
(RPI Physics students – all grad program fields)

- Scatter means that GPA is a necessary but not sufficient condition for acceptance to higher ranked schools.
- No acceptance anywhere for GPA below 3.1
- Top 10 programs usually 3.6+ (other strengths required).
Employment

• Engineering – EE, Materials, Systems
• Software/Interfacing
• Modeling
• Finance
• Hardware development (optics, semiconductors)
• Environmental
Companies

- GE
- IBM
- Boeing
- Navy
- Lockheed Martin
- Cadmus Group
- AD Little
- National Instruments
- Bank of America

- Axcelis
- Teledyne
- Intelepix
- Teredyne
- Crystal IS
- RPI
- Spectra Environment Group
- Bloomberg News
- Microsoft
- TransTech Systems
Center for Career and Professional Development

- The CCPD offers a comprehensive program of career and professional development activities, co-op, internship, and full-time job search activities to both undergraduate and graduate students.
- CCPD’s 4-year plan for developing a direction and career for undergraduates
- Career counseling, assessment, and inventory
- Sophomore Career Experience includes several events just for sophomores
- Go to CCPD website now to get access to assessment, resume, job listings, interviews…
  (to save time, you can just give the info to your mother and she will present you with a complete life plan in a few weeks)
Planning a path

• The Core
• Honest self-evaluation
• Select electives
• Re-evaluate
• Examples of paths
• Be sure to do well at/like something
The Physics Core

- Honors Physics I and II
- Modern Physics
- Experimental Physics
- Quantum Physics
- Theoretical Mechanics
- Thermodynamics and Stat Mech
- Electromagnetic Theory
- Introductory Quantum Mechanics
- Research/Capstone/ Physics Elective
Physics and Astronomy Electives

• Fundamentals of Optics
• Intro Astronomy and Astrophysics
• Observational Astronomy
• Solid State Physics
• Astrophysics
• General Relativity
• Intro Particle Physics
• Optical Communications
• Computational Physics
• Graduate courses
First Steps

• Identify special areas that you enjoy and that you are good at*
  – Sample possible areas early
    • Materials, Electronics, Computer Science, Analysis, Economics…

• Identify “next” courses that build your experience and resume

* that might lead to employment
First courses

• Materials Science for Engineers
• Electric Circuits or Electronic Instrumentation
• Atomic and Nuclear Physics
• Introduction to Nuclear Engineering
• Fundamentals of Optics
• Intro to Astro and Astro
• Comp Sci 1 and Data Structures
Some undergraduate paths/concentrations

1. Physics (grad school)
2. Astronomy
3. Electrical Engineering
4. Materials Science
5. Geophysics
6. Computer Science
7. Mathematics
8. Aero/Mechanical Eng
9. Acoustics
Example 1
(now in grad school for Solid State Electronics)

- ENGR1600 MATERIALS SCIENCE FOR ENGRS
- MTLE2100 STRUCT OF ENGINEER MATLS
- MTLE4200 PROPERTIES OF MATLS I
- PHYS4962 INTRO TO THIN FILM DEPOSITION
- MTLE4030 INTRO TO GLASS SCIENCE

- MTLE6120 ADVANCED ELECTRONIC PROPERTIES
- PHYS4940 HYBRID NANOSTRUCTURE SENSORS
- BMED4967 INTRO TO BIOPHOTONICS
Example 2
(now in grad school for Architectural Acoustics)

- ENGR1600 MATERIALS SCIENCE FOR ENGINEERS
- ENGR2090 ENGINEERING DYNAMICS
- MANE4610 VIBRATIONS
- MANE4830 ACOUSTICS ENGINEERING

- Orchestra, Ensemble, Music Theory 1 and 2
- CSCI4800 NUMERICAL COMPUTING
- CSCI2300 DATA STRUC & ALGORITHMS
- CSCI2500 COMPUTER ORGANIZATION
- CSCI4380 DATABASE SYSTEMS
Example 3
(now employed as Materials Engineer)

- ENGR1600 MATERIALS SCIENCE FOR ENGINEER
- PHYS2620 FUNDAMENTALS OF OPTICS
- MTLE2100 STRUCT OF ENGINEER MATLS
- MTLE4100 THERMODYNAMICS OF MATLS
- MTLE4200 PROPERTIES OF MATLS I
- MTLE4030 INTRO TO GLASS SCIENCE
Example 4
(now in grad school for Materials Science)

• MTLE4160 SEMICONDUCTING MATERIALS
• PHYS2620 FUNDAMENTALS OF OPTICS
• PHYS4640 OPTICAL COMM & INTEGRATED OPT
• PHYS4720 SOLID STATE PHYSICS
• PHYS4961 OPTICAL PROPERTY OF MATERIALS
• ECSE4962 OPTOELECTRONICS TECH
Example 5
(employed as Logistics Engineer)

- ECON1200 INTRODUCTORY ECONOMICS
- ECON2010 MANAGERIAL ECONOMICS
- MGMT2320 MANAGERIAL FINANCE
- ECON2020 INTERMEDIATE MACRO CON
- MGMT2300 ACCT FOR DECISION MAKING
- ECON4130 MONEY & BANKING
- MATH4740 INTRO TO FINL MATH AND ENGR
Example 6
(now in grad school for Geoscience)

- ERTH1100 GEOLOGY I: EARTH'S INTERIOR
- ERTH1200 GEOLOGY II EARTH'S SURFACE
- CHEM1200 CHEMISTRY II

- ERTH2100 INTRO GEOPHYSICS
- ERTH2140 INTRO TO GEOCHEMISTRY
- ERTH4750 GIS IN THE SCIENCES
- ERTH2620 CURRENT TOPICS ERTHSCI
- ERTH2330 EARTH MATERIALS