Physics & Astronomy Career Workshop #3

Finding a job:

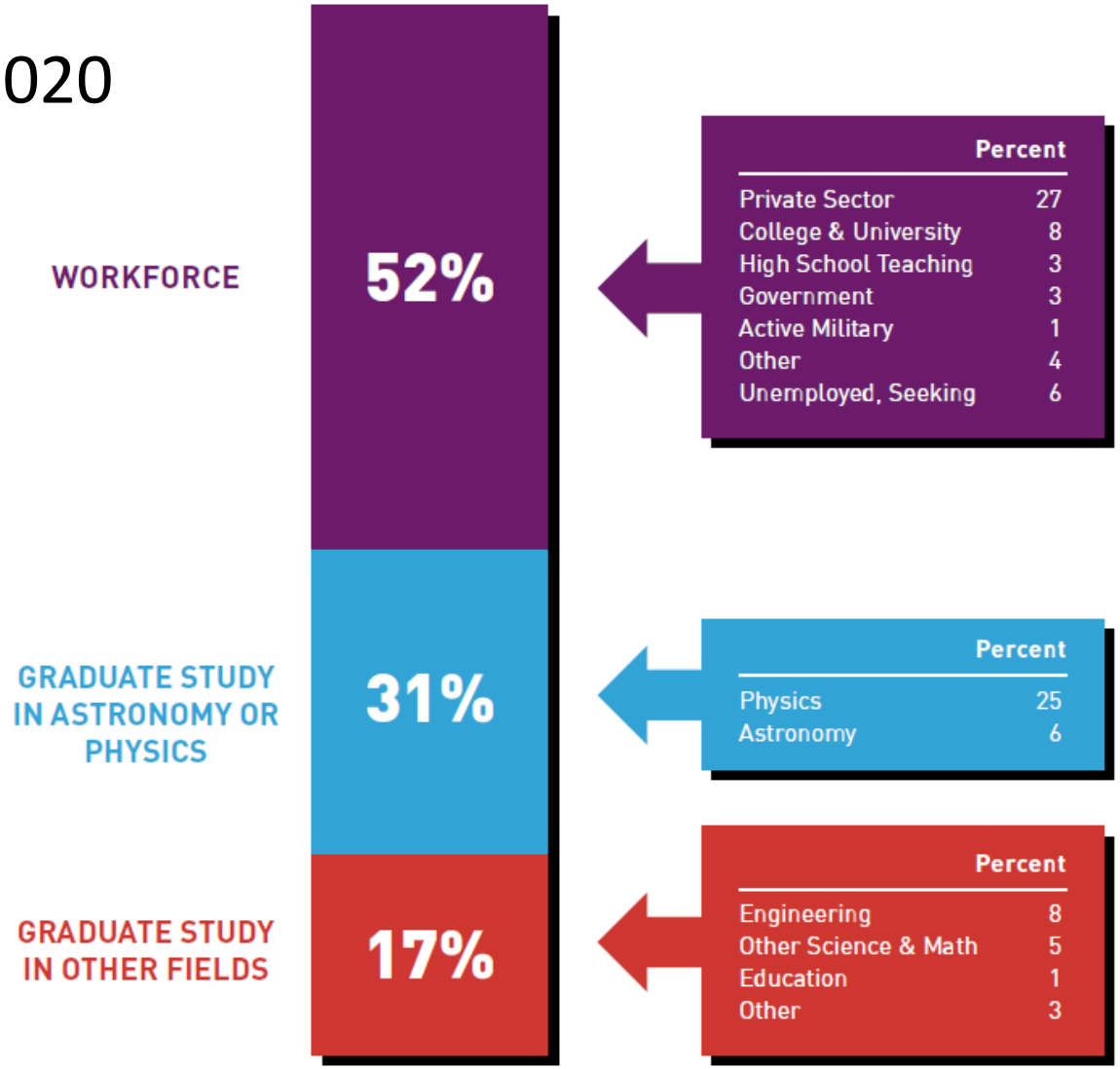
Résumés and cover letters

16 April 2024

Physics Bachelors 1 Year Later

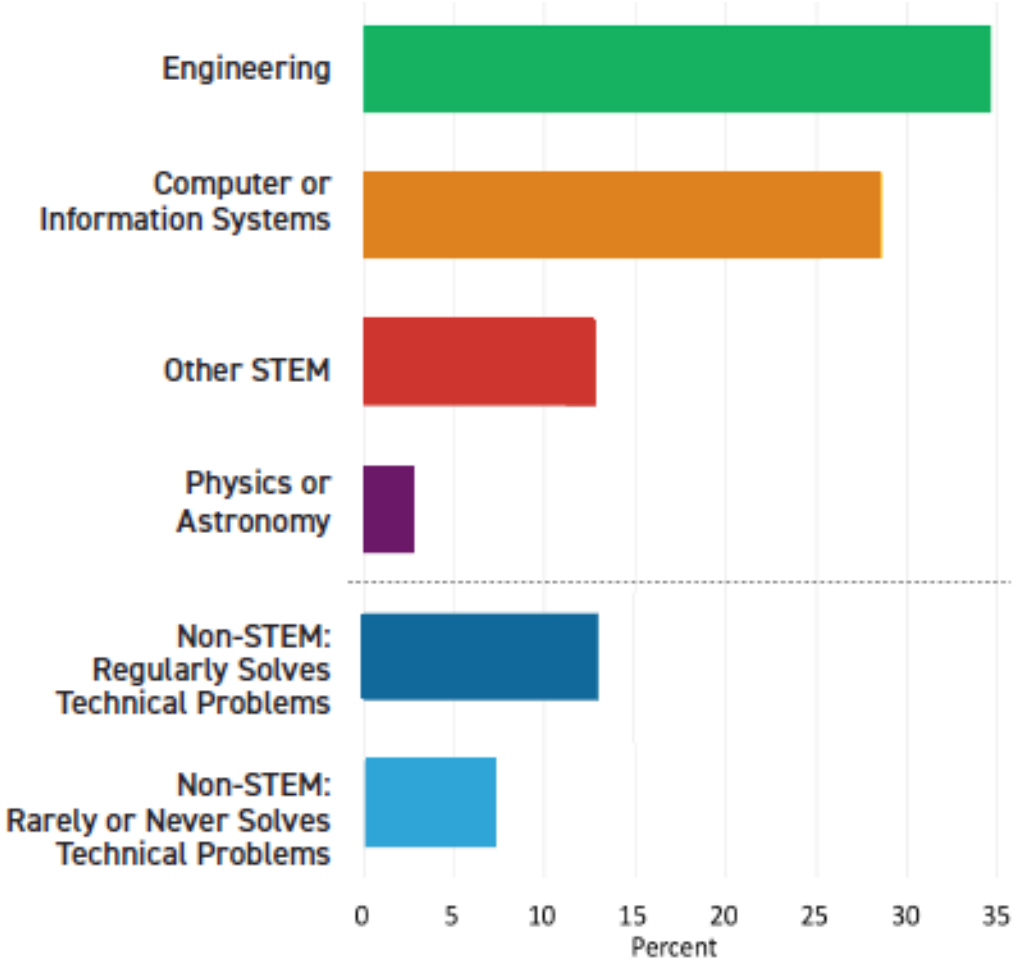
9,250 Recent Degree Recipients

Classes of 2019 and 2020 combined



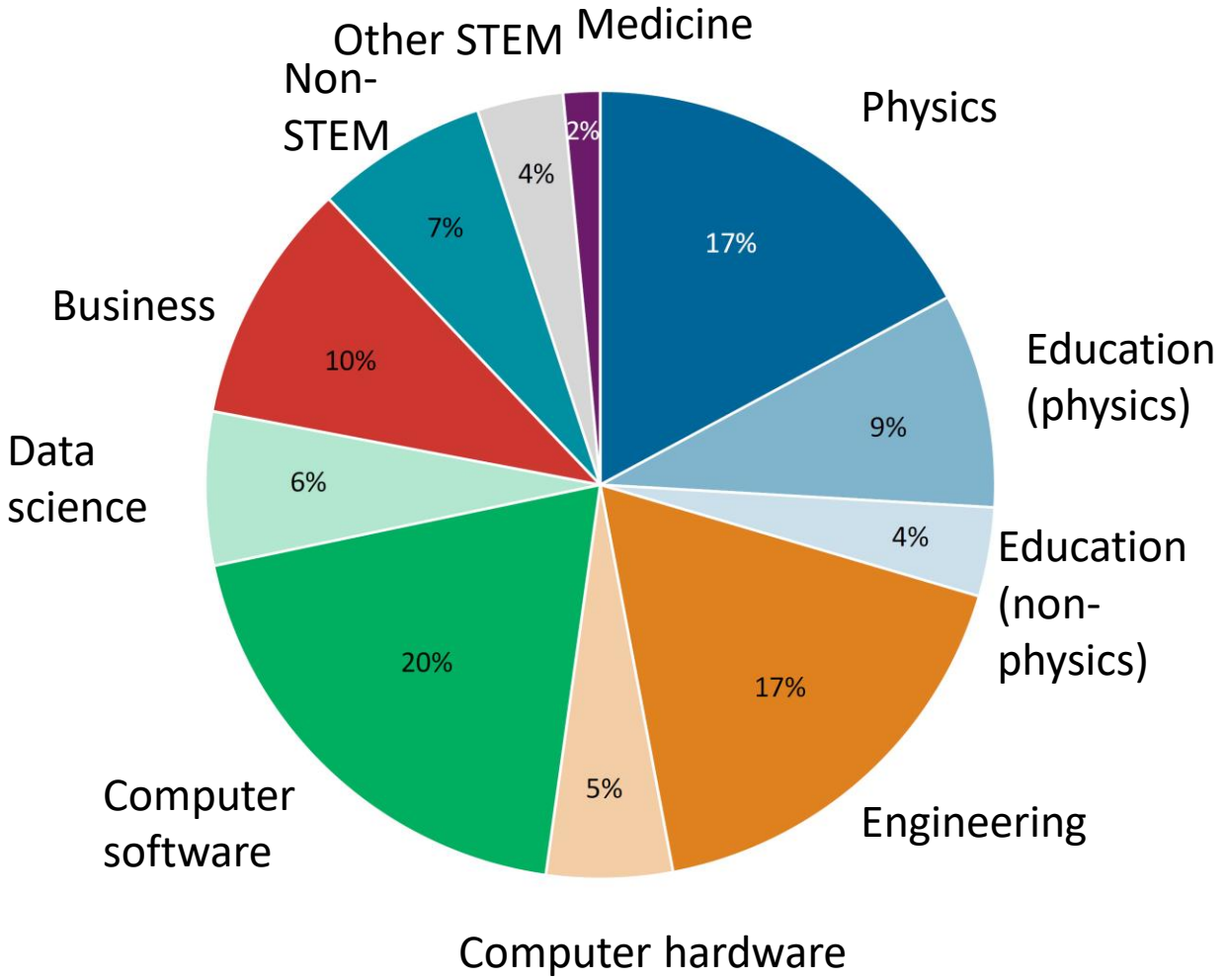
Employment fields of new graduates

Bachelor's (private sector)

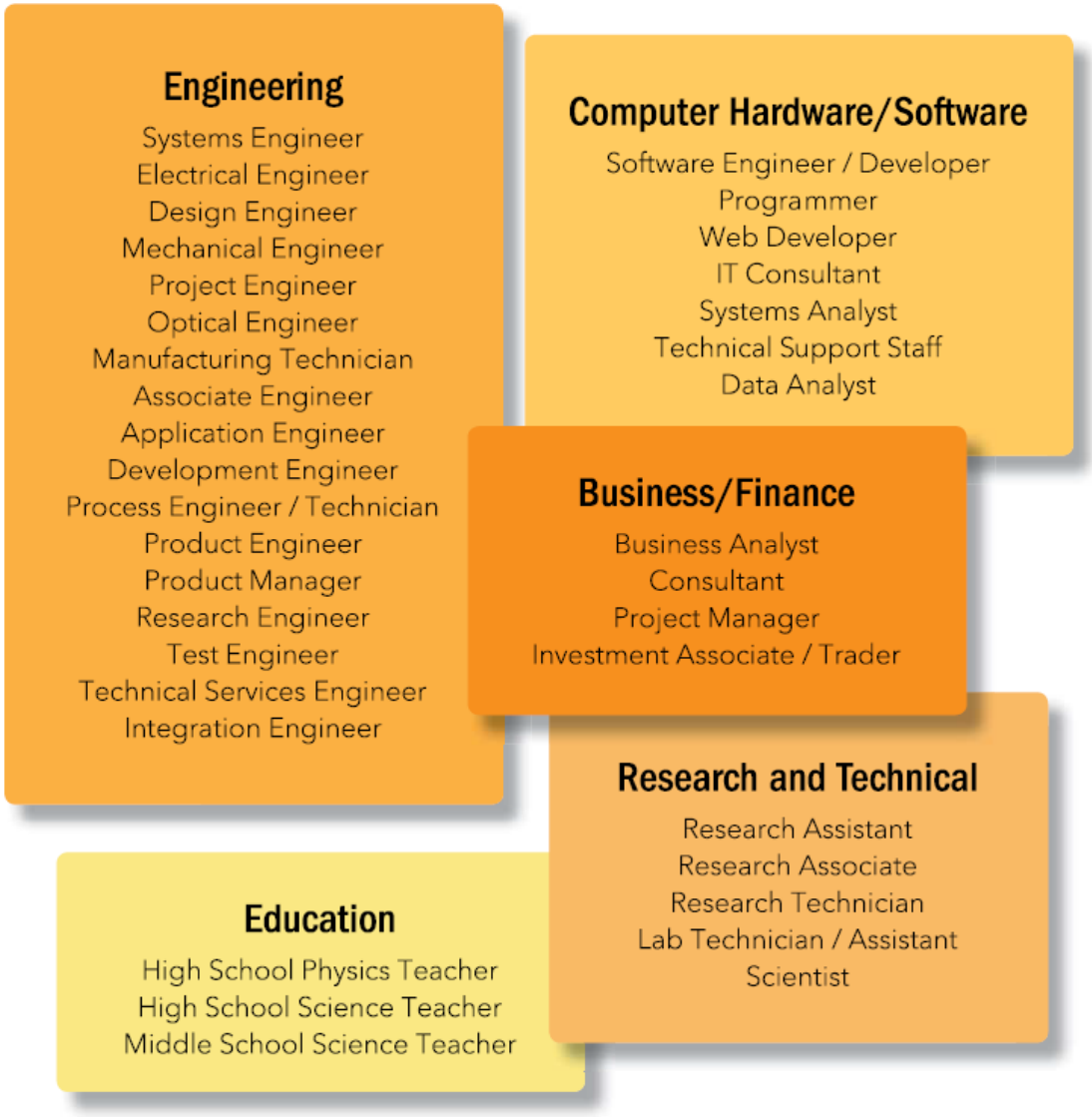


AIP Statistical Research Center

PhD (potentially-permanent)



Common Job Titles of New Physics Bachelors



AIP Statistical Research Center

Source: AIP Follow-up Survey of Physics Bachelors, classes of 2015 and 2016.

Common job titles for new physics PhDs

Engineering
Aeronautical Engineer
Applications Engineer
Battery Test Engineer
Characterization Engineer
Development Engineer
Device Modeling and Testing Engineer
Laser and Optics Engineer
Process Technology Development Engineer
R&D Engineer
Systems Analyst
Systems Engineer
Technical Specialist
Senior Design Engineer
Sensor System Engineer

Computer software
Analyst / Programmer
Application Developer
Associate Software Engineer
Autonomy Engineer
Flight Software Engineer II
Mathematical Analyst and Developer
Scientific Programmer

Data science
Data Analyst
Machine Learning Engineer
Research Analytics Consultant
Tech Data Scientist II

Business
Algorithm Developer
Credit Research Associate
Data Analyst
Quantitative Financial Analyst
Risk Insights Analyst
Senior Analytics Consultant

Foundational activities: Self-knowledge

Keep a career journal

Goals: what is important to me?

- Make the world better
- Make a lot of money
- Live in Colorado
- Work-life balance/time for family or hobbies
- Traveling

Interests: how do I like to spend my time?

- Tinkering with equipment
- Coding
- Analyzing data/figuring out the Universe
- Writing
- Working with other people

Strengths: what am I really good at?

- Keeping track of details
- Seeing the big picture
- Writing
- Working with diverse teams
- Writing code
- Making equipment work

Foundational activities: Self-assessment

Skills inventory: what can I do, and when have I done it?

Identify skills and an example of where you have used them

Technical skills

- Solving complex technical problems
- Teaching: conceptualizing & explaining
- Programming
- Documentation
- Data and error analysis
- Advanced mathematics
- Simulation and modeling
- Using (and repairing) specialized equipment
- Quality control
- Machining

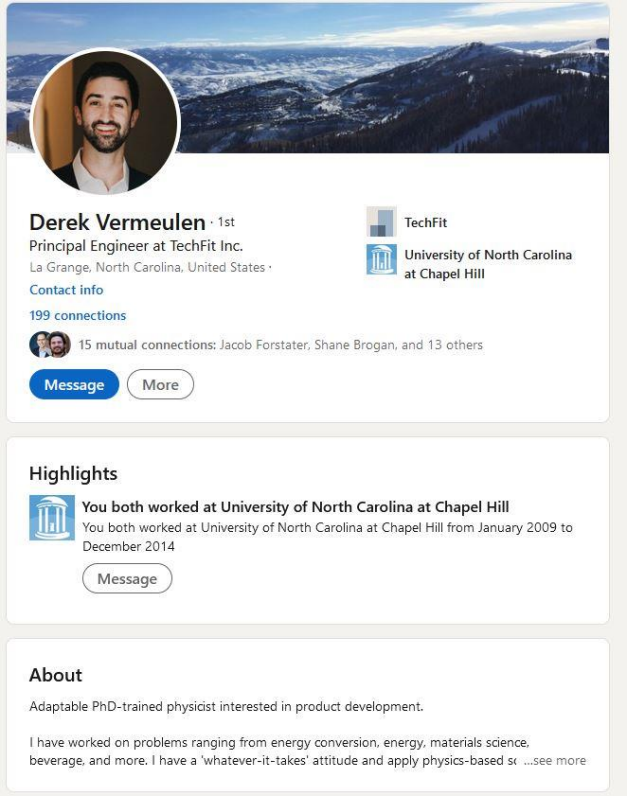
Non-technical skills

- Functioning in a variety of environments and roles
- Writing concisely and accurately
- Presenting information orally
- Tailoring your message to an audience
- Supporting a position with argumentation, logic, data
- Conceiving/designing complex projects
- Implementing and managing to completion
- Managing/leading groups of people
- Managing projects (creating task lists, developing timelines, setting goals, etc.)
- Planning for and obtaining necessary resources (e.g. funding)
- Developing and managing budgets
- Working on a team

You will use this when you write a résumé in workshop #3

Your LinkedIn profile https://www.linkedin.com/

- Use a good photo—people remember faces better than names!
- Companies often use employment search firms (“headhunters”)
  - Professionals are typically on LinkedIn
  - LinkedIn is keyword-searchable
- Put careful thought into what you list in the various sections:
  - About
  - Background
  - Skills
  - Accomplishments
- Look at profiles of other physicists for guidance



See also advice from UCS: https://careers.unc.edu/students/networking-and-social-media/how-build-your-linkedin-presence

Skills-based résumé

What it is not

- An academic CV
- A list of positions you have held
- Generic, used for all the jobs you apply to
- Intended to get you the job
- Longer than one page

What it is

- A selection from your skills inventory containing key words from the job ad
- Specific to the job you are applying for
- A list of accomplishments showing what you could do for the company
- Intended to get you an interview
- One page (with the important stuff at the top)

Maryellen Z. Physiker
1222 Science Drive
Columbia, MO 63802

Objective

Engage in research in atmospheric phenomena relevant to climate science.

Education

- BS, Physics, Univ. of Wyoming, 2014
- MS, Physics, Univ. of Idaho, 2017
- PhD, Physics, Univ. of Idaho, 2020

Work Experience

- Postdoctoral Fellow, Dept. of Physics & Astronomy, Univ. of Missouri 2020-present
- Research Assistant, Dept. of Physics, Univ. of Idaho 2014-2020

Publications

- M.Z. Physiker and P.K. Martin, "Remote sensing in turbulent atmospheres," *Geophys. Rev.* **39**, 1793 (2020).
- M.Z. Physiker, R.S. Jones and L.W. Fowler, "High spectral resolution studies of cirrus clouds and of the greenhouse effect," *JGR Atmospheres* 126, 27 (2021).

Presentations

- "Cirrus clouds," AGU Annual meeting 2021

Instrument Design Engineer/Scientist

Location: California
Salary: $60,000 - $125,000 depending on qualifications

Job Description:
The successful applicant will lead a new instrument team, and will have experience in microcontrollers, data acquisition, analog and digital signal processing, and algorithm design.

Ability to read schematics is also desirable. Candidates should also have strong written and oral communication skills, and should be comfortable in a leadership position and working with a team.

Does it look like Maryellen is a good fit for this job?

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Presentations

- "Cirrus clouds," AGU Annual meeting 2021

She wrote the data analysis code that is essential to the work of her postdoc group; they will be using it long after she leaves.

In her spare time, she developed and led a highly successful outreach program for local middle school students.

Maryellen designed and built the entire electronic data acquisition system for her experiment.

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1222 Science Drive
Columbia, MO 63802

Data Acquisition Experience

- Designed and built optical sensors and electronic data acquisition system for remote sensing in turbulent atmospheres (Research Asst., Univ. of Idaho, 2014-2020)
- Designed novel noise-reduction digital signal processing algorithms for background isolation and removal (Research Asst., Univ. of Idaho, 2014-2020)

Software Design Experience

- Wrote data analysis software using C++ and IDL to process analog signals from remote sensors; software used in all projects of research group (Postdoctoral Fellow, Univ. of Missouri, 2020-present)

Leadership Experience

- Developed and led 25-member team in science outreach to local middle schools (Research Asst., Univ. of Idaho, 2014-2020)

Education

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Active verb past participles

MANAGEMENT

administered	chaired	delegated	executed	oversaw	recommended	supervised
analyzed	consolidated'	developed	improved	planned	reviewed	
assigned	contracted	directed	increased	prioritized	scheduled	
attained	coordinated	evaluated	organized	produced	strengthened	

COMMUNICATION

addressed	collaborated	directed	formulated	mediated	promoted	spoke
arbitrated	convinced	drafted	influenced	moderated	publicized	translated
arranged	corresponded	edited	interpreted	negotiated	reconciled	wrote
authored	developed	enlisted	lectured	persuaded	recruited	

RESEARCH

clarified	diagnosed	extracted	interpreted	organized	surveyed
collected	evaluated	identified	interviewed	reviewed	systematized
critiqued	examined	inspected	investigated	summarized	

TECHNICAL

assembled	computed	engineered	operated	remodeled	upgraded
built	designed	fabricated	overhauled	repaired	
calculated	devised	maintained	programmed	solved	

Active verb past participles

TEACHING

adapted	coached	demystified	encouraged	facilitated	instructed	goals
advised	communicated	developed	evaluated	guided	persuaded	stimulated
clarified	coordinated	enabled	explained	informed	set	trained

FINANCIAL

acted	customized	directed	founded	instituted	invented	planned
conceptualized	designed	established	illustrated	integrated	originated	revitalized
created	developed	fashioned	initiated	introduced	performed	shaped

HELPING

assessed	coached	diagnosed	facilitated	motivated	represented
assisted	counseled	educated	familiarized	referred	
clarified	demonstrated	expedited	guided	rehabilitated	

CLERICAL OR DETAIL-ORIENTED

approved	collected	generated	operated	purchased	specified
arranged	compiled	implemented	organized	recorded	systematized
catalogued	dispatched	inspected	prepared	retrieved	tabulated
classified	executed	monitored	processed	screened	validated

MORE VERBS FOR ACCOMPLISHMENTS

achieved	improved	reduced (losses)	resolved (problems)	restored	transformed
expanded	pioneered			spearheaded	

Résumé exercise

Write a résumé that responds to the job ad you have found.

Remember:

- The person who does the first screening of your résumé will *not* be the person who wrote the job description
- The first screening may be done by an algorithm (bot) rather than a person
- The keywords in the résumé must align with those in the job description
- The most important information must be at the top of the (single) page

Exchange your résumé and job description with a neighbor.

What to look for:

- Do the keywords in the job description appear in the résumé, in order?
- Do the accomplishments listed relate to the job requirements in a way a non-expert could understand?
- Would the HR person be likely to schedule an interview?

Résumé analysis

- Did you list specific accomplishments (results), showing rather than telling? (“Developed searchable database of department graduates using Python coding” rather than “proficient in Python”)
- Did you include equipment and software you have experience with, and what you have done with them?
- Do the accomplishments you list align with the skills in the job description, in order?
- Do your descriptions focus on major tasks and results, omitting irrelevant detail?
- Did you use past participles of active verbs?
- Did you include skills developed outside of your academic work, including in non-school training (e.g. Outward Bound)?
- Did you include non-technical accomplishments involving teamwork, leadership, project management, written and oral communication, etc.?
- Could you back up your statements about your skills? If you said you are “proficient” in something, could you demonstrate that in an interview?

The cover letter

- Restate résumé information in full sentences
- Include reasons to hire you even if you don't have amount of experience listed
- Explain what you hope to learn and skills you hope to develop in the job
- Focus on what you can do for the company
- No longer than one page!
- Include with application whether requested or not

- Address as specifically as possible (and don't say "Dear Sir;" HR person may be female)
- Opening paragraph: identify position (company may have several!) and how you found out about it; explain why you want *this* job
- Middle paragraph (or two): explicitly connect your background and experiences with job requirements. Show, don't tell.
- Last paragraph: thank employer for consideration, say you are flexible and eager to meet in person, give contact info, reiterate excitement