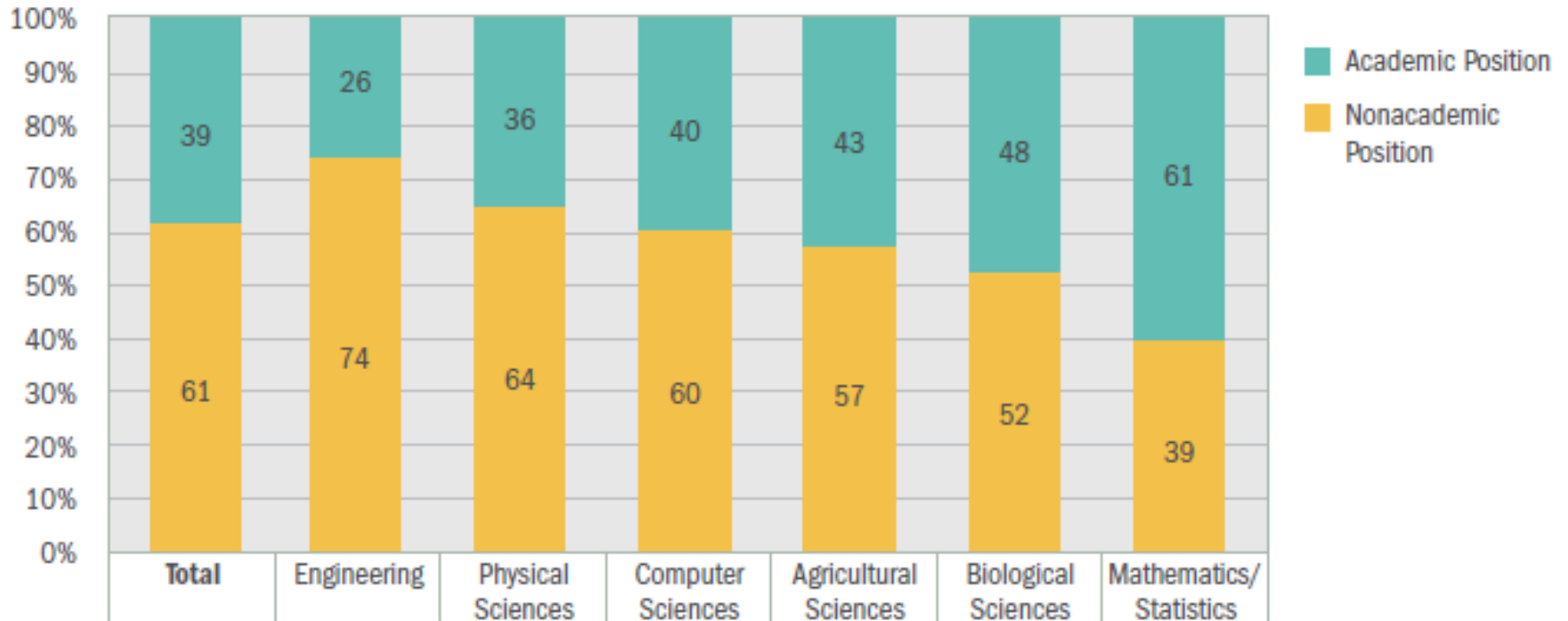# EPP Module

Motivation

A majority of STEM PhD holders work in non-academic careers
Private, for-profit sector largest employer of nonacademic STEM PhD holders

STEM at American Institutes for Research, Issue Brief, 2014

- Helps to know project planning in both academia and industry
- Helps to know how industry operates when collaborating

Industry Module

- Engineering Project Plan and Kickoff Presentation 10%

- Final Report and Presentation 10%

- Project Meeting Notes and Updates 5%

Engineering Project Plans

- An engineering project plan (EPP) is a concise, formal, approved document used to guide both project execution and project control.

Engineering Project Plans

Features:

1) Formal and approved document

2) Living document from project start to finish

Why are these important?

- Forces everybody to agree on the plan
- Forces everybody to discuss and approve plan changes

Engineering Project Plans

Components

1) Motivation from an organizational perspective

2) Sets baseline expectations for scope

3) Sets baseline expectations schedule/tasks

4) Sets baseline expectations for cost

5) Defines roles and responsibilities

6) Includes a risk management plan

7) Includes a communication plan

8) Can also include a procurement plan

9) Can also include a quality plan

Engineering Project Plans

- **Motivation from an organizational perspective**
  - Communicates your project is important
  - Potentially attractive reasons to do something:
    - Makes money – how much?
    - Develops internal capabilities or infrastructure
    - Improves health or safety in the company itself

    Should be short and to the point!

Engineering Project Plans

- **Sets baseline expectations for scope**
  - Avoids scope creep
  - Scope: work performed to deliver a product, service, or result with the specified features and functions
  - 3 Parts for you project:
    - Vision: what does success look like? (Be specific for this project only – not pie in the sky)
    - Peptide design: exact sequence, design elements, and a list of design constraints (need peptides fast)
    - Test plan and matrix: list the characterization tool(s) and list exact tests you wish to perform in a table

Peptide Constraints

- Need them fast (part of procurement plan)

Length		5-15aa		16-25aa	
Qty TAT		1-19mg	20-100mg	1-19mg	20-100mg
Purity	crude	7	7	8	8
	Desalt/>70%/>75%/>80%/>85%/>90%/>95% purity	11	13	13	15
	98% purity	12	13	14	16

- Other design constrains for your specific application

Test Matrix

- Test matrix example:
  - A tabular or graphical display of your independent variables (things you control)
  - Shows exactly what data you will get

Sample	Loading	SEM Magnification
Nanoparticles with Peptide	High Low	10x, 50x 10x, 50x
Nanoparticles without Peptide	N/A	10x, 50x

Engineering Project Plans

- Sets baseline expectations schedule/tasks
  - Avoids schedule creep (being late!)
  - Easily can break down goals into smaller parts and aim for those
  - Your Project:
    - Provide a list of tasks to be completed with a due date for each one (best in a table).
      - Kickoff, Final Report and Presentation
      - Any trainings that are needed or approvals for work in a lab
      - Peptide design and ordering
      - Other ordering

Engineering Project Plans

- **Sets baseline expectations for cost**
  - Avoids going over (or WAY under) budget
  - Your Project:
    - Provide an estimated cost for specific components of the project ($1000 total budget)
      - Can be estimates – best to get quotes
      - Generally broken down into materials, labor, analysis..
      - You should be as detailed as possible here since your scope is small
      - Keep track of your budget!!! Assign this to somebody in the group as a specific task

Engineering Project Plans

- **Defines roles and responsibilities**
  - Defines clear roles for the team
- **Your Project:**
  - Make a list of personnel involved with their roles and responsibilities
    - Team members (including a project leader) – assign specific tasks (who is in charge of ordering? Test plans? Design? Can be more than one person in charge)
    - Lab technician
    - Instructure (supervisor)
    - Anybody else expected help or provide resources in this project (like those at the centers you plan to visit to get data)

Engineering Project Plans

- **Includes a risk management plan**
  - Helps mitigate risk
  - Your Project:
    - Include a critical issue analysis table at the end of your document
      - Creative in determining potential issues
      - Ask yourself – what does failure look like at the end of this project and how can I avoid it?

Critical Issue Analysis Table

Potential Issue	Likelihood of Occurrence (L/M/H)	Potential Negative Impact (L/M/H)	Mitigation Strategy

Engineering Project Plans

- ## Includes a communication plan
  - Avoids anybody saying "I didn't know!" or "I didn't need to know"
  - Your Project:
    - What is the policy on emails/calls? Will a record of calls be kept? Who will be included on emails?
    - Answers – who should know what and when?
    - Who will be sent meeting minutes? How often/when/where might meetings occur?
    - Are there any final reports/presentations?
    - Will there be a kick off?

Engineering Project Plans

- Can also include a procurement plan
  - Avoids delays due to purchasing
  - Who here has told their advisor they couldn't do something because it wasn't ordered? This avoids that.
  - Also helps you identify new options early
- Your Project:
  - What to order, how long, what are expected lead times, obtaining quotes early enough to make decisions
  - Submitting orders and accounting for processing times (by when do I need to submit an order to get what I want when I want it?)

Engineering Project Plans

- Can also include a quality plan
  - Avoids having to redo project due to quality
  - What are your products? Data and reports
  - How do I ensure my products are of high/adequate quality?
  - Your Project:
    - Consider your data and reports/presentation
    - Quality data – ensure properly trained, and at least 1 repeat
    - Quality reports/presentations – assign the task of editor to a group member, participate in feedback sessions for class