PURDUE UNIVERSITY | Mechanical Engineering

Individual Development Plan (IDP) for ME Online Master's Non-Thesis Students

Purpose:
The College of Engineering released a generic IDP plan for graduate students, and we've modified it so that it can help you optimize your success in the Mechanical Engineering graduate program. An IDP allows you to internally reflect on your goals and skills and sets your plan on how to improve skills you see that are vital to you being successful in your future career plans. While a lot of our online students are already employed full-time, not all are, and others may be looking at switching employment, so please address the IDP items as needed for your individual situation.

Recommendation:
Complete your initial IDP prior to your start in the graduate program. Once completed and you have an idea of your professional goals and the type of work environment that will make you most successful and help you accomplish your goals, it'll aid in your journey through your graduate program to hopefully, be smooth and enjoyable.

Fill out the IDP with intrinsic motivation, imagining your ideal career and what you need to obtain that position. Writing down your goals and how you plan to accomplish them, being as specific you can, will increase the likelihood of you accomplishing what you've set out to do.

Plans do change, so make sure to evaluate at the beginning of each semester, and update as you go along.

Questions you can ask to get yourself started:

- What do I want to do after I graduate?
- When looking at my future, what is most important to me?
- What sort of impact do I want my future job to have?
- What skills do I need to be successful in my ideal career?
- Do I need to participate in certain activities to develop interpersonal relationships?
- What type of mentoring do I need?
- How will I develop contacts or networks in relation to my career goals?

Steps to complete your IDP:

1. Self-Assessment: Get to know yourself better—your personality, interests, values, and skills. This inner reflection will help you identify jobs and personal/professional career goals best suited to you, and identify any knowledge or skills that you might need to improve or acquire to achieve your goals.

   We've provided some skills you can evaluate yourself against starting in Appendix 1, on page 8. There are also many free personality and career planning tools online to help you with your self-assessment; we've listed just a few below:
   https://www.truity.com/view/tests/personality-career
   https://www.123test.com/career-test/
   https://www.careerfitter.com/free_test/careerbuilder/test

2. Research your career options: Once you know more about yourself and what you're looking for, you can start to research jobs that play to your strengths. Research companies that interest you or positions within your current company. Take advantage to talk with people currently in those positions, or if a new company, try to contact their representatives when they visit campus or post job openings on our ME Grad Blog, or with the Center for Career Opportunities office (see below). You may want to plan to do internships at the company, talk to professionals in the field, attend the professional seminars offered virtually by ME and other schools, etc.

   A great resource on Purdue's campus is the Center for Career Opportunities, https://www.cco.purdue.edu/ who offer a lot of helpful services---resume review, mock interviews, career fairs, career exploration, networking guidance, job postings, etc. Their services are free to Purdue students, and they'll even be available to you as an alumni. Check them out!

   You should also subscribe to the ME Grad Blog, if you haven't already, https://purduemegrad.blog/, as our office and our professors are contacted by companies looking to hire Purdue engineers, and we post all opportunities on the blog.
3. Set your Goals: What do you want to be doing in two years? In five years? In ten years?
   - Be specific as possible as to what you want to achieve.
   - Define it in a physical way so you can track your achievement
   - Make goals that are achievable and relevant to you
   - Set a deadline to achieve, to stay on track.
4. Develop your plan and implement it *(we've provided an example on how to get started in Appendix 2, on page 10, with a blank form for you to copy and modify for yourself on page 11)*:
   - Identify and investigate multiple career paths—Is teaching for you? Do you want to eventually pursue the legal profession, like as a patent attorney, or safety investigator? Is your interest research only, or implementation?
   - Be realistic about expectations and timelines.
   - Understand that things change, and continue to review and amend your career plan as needed.
5. Review and adjust your plan: Life happens and things change, so it's OK if your goals change. Just continue to review your plan at least once a year--what goals you've achieved, what skills you've developed, and figure out if you need to change your strategy or put more effort into achieving your initial plan.

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General Degree Timeline

This timeline provides you with a general idea of checkpoints to keep you on track. It's your plan, so it's OK to be a little ahead, or behind your plan, as long as you meet ME's degree requirements and stay in compliance with Purdue's policies/procedures.

Year 1:

Learning & Research:

- Bookmark the ME Grad website, as this covers all the ME policies/procedures and is always kept updated. Review ME's requirements for obtaining your degree, and mark your calendar to attend the virtual meetings that are held for incoming students, 'How to Navigate Grad School in ME' and 'Plan of Study'. Details/links for all virtual meetings and ME's virtual office hours can be found on the ME Grad Blog. All academic administration questions, should be directed to your academic advisor, and can be emailed to megradoffice@purdue.edu.
- Review and complete the incoming student to-do list on the ME Grad website.
- If you end up making arrangements with a ME faculty member to work on an independent study project, check regarding various lab operational procedures and expectations. We've added some sample questions in Appendix 3, on page 12, to get you started.
- During orientation week, you'll attend ME's virtual Orientation, and if ever working in a research lab, you'll be required to attend research lab orientation/safety training.
- Register, in courses that will help you improve knowledge in your area of interest. Check with your course instructors for other courses you might not be aware of, that would be of interest, or other learning opportunities they may be aware of; after all, they are experts in their fields. Plus, use the opportunity to build your network!
- Scout out and engage in opportunities to increase your skill set. You can find an entry-level programming in Python course available, if needed. Learn how to use MATLAB and Simulink, if needed, as you have unlimited access to all MathWorks products. Pursue other opportunities that will be help you to be successful in your coursework and research.
- Submit your initial Plan of Study (POS), between the 3rd-6th week of your first semester.
- Check into the various free Grad School workshops offered, every semester, https://www.purdue.edu/gradschool/professional-development/workshops/index.php, as these can cover a variety of topics, including secrets to industry interviewing, elevator pitch workshops, converting your CV to a resume', and other personal and professional opportunities.
- Monitor the ME Grad Blog for course information, seminars, and other announcements.

Communication:

- Learn who the key contacts are in various areas---department, (lab?), college, etc. Begin forming respectful relationships with them. Some other special resources that might be helpful to you, are listed below:

-Veteran Success Center
-Disability Resource Center
-Cultural & Resource Centers
-International Student Services (ISS)

- Learn to organize, interpret, and present your data.
- Work on effectively communicating results in written, oral, and graphical form:
  -develop technical writing skills through feedback from your instructors.
  -utilize the Purdue Writing Lab to improve your skills
  -attend Graduate School workshops that help with developing an elevator pitch, preparing a demonstration, publishing a scientific paper, and more.
  -Purdue Language & Cultural Exchange (PLaCE)—supports international students who learned English as a second language and offers language and cultural support as you adjust to life at a US university.
- Review 'How to Talk to professors about Personal Matters'; these tips can apply to improving communication with your course instructors, or other parties.

Professional Development:

- Get Involved and develop interpersonal relationships and leadership skills. Just a few organizations that may offer programs of interest are listed below, but you can find others around campus that offer virtual opportunities:
  -OMEGA (ME's Grad Student Organization)
  -Women in Engineering
  -Purdue Student Activities & Organizations
  -Purdue Graduate Student Government
- Pursue a graduate certificate while completing degree requirements; see https://online.purdue.edu/programs/online-certificates for various online engineering certificate programs offered at Purdue.
- Improve your teaching skills:
  -Teaching and Learning in Engineering Graduate Certificate program
  -College Teaching Development Program, by Center for Instructional Excellence
  -Engineering Academic Career Club at Purdue
- Burton D. Morgan Center for Entrepreneurship—offers the certificate in entrepreneurship and innovation program, the Purdue Foundry, innovation communities, and more.
- Seek out other ways to develop yourself that will align with your goals.

Career Development:

- Learn about the career opportunities for someone with your degree. Search the internet, talk with instructors/peers/family members, seminar speakers within ME and other schools on campus, check out what the Center for Career Opportunities, https://www.cco.purdue.edu/ can offer, etc. Do your homework; a ME degree is very versatile!
- Seek opportunities to mentor younger students or undergraduates, local after-school programs, etc. We've added some points about what makes a good mentee and mentor in Appendix 4, on page 13, for you.

- Identify your natural and learned skillset to match your career options.
- Investigate/pursue internship opportunities with companies that align with your career interests.
- Check out Purdue's GRID, which helps expand the international development network among graduate students and provides events and resources to succeed in global endeavors.
- Explore Purdue's Cultural and Resource Centers, as these are open to all students, not just students from a particular culture. They hold various events, including seminars, that are open to all Purdue students.
- Prepare yourself in other ways to thrive in a diverse global environment.

Well-Being:

While it's important to focus on your coursework and research, you still need to build some work-life balance into your overall plan.

- Check out the local tourism options in your area and explore; sometimes you'll be amazed at what is offered in your own community and nearby areas.
- If your schedule and home environment allow, consider adopting a pet—whether that's a gold fish or a golden retriever, or something in between.
- Remember, you can read books for fun, too!
- Take advantage of physical work-out opportunities—go for a hike or bike ride, etc.
- Volunteer! You'll be surprised at how volunteering adds to your overall well-being, but it also opens you up for various service scholarships.

Year 2-10:

Usually, you'll complete your online Master's non-thesis degree within 3.5-4.5 years, but it may run a little longer if you have had to 'sit out' for a semester or more based on work load, family responsibilities, etc. You have up to 10 years to complete the online degree as long as you remain active, if you need it, but obviously most will complete much sooner than that. We'll cover your wrap-up timeline below, but you should adjust it to your expected degree completion.

Learning and Research:

- Continue to monitor current literature and discoveries in your areas of interest.
- Set short- and long-term goals to stay on track to graduation.
- Continue to register for coursework to complete degree requirements.
- Continue to improve your ability to think creatively, troubleshoot, and design experiments to resolve problems and demonstrate expertise in your field of study.
- Attend relevant conferences as you deem appropriate.
- Set a tentative timeline for graduation.
  -In the semester you plan to graduate, watch the Grad School calendar for the candidate registration deadline. You have to register to graduate You also have to register to participate in commencement; this is in addition to registering as a candidate.
  -Review the Graduation/Candidacy webpage on the ME grad website, https://engineering.purdue.edu/ME/Graduate/Online/Graduation
  -Plan to attend the graduation/candidacy virtual meeting (details/link can be found on the ME Grad Blog).
  -If attending commencement, watch to RSVP for the ME candidate reception as well as the online student reception.

Communication:

- By now you should have established methods of organizing, interpreting, and presenting your data.
- Attend at least one conference to present your work (poster or verbal) and/or network.
- Request feedback from your instructors, peers, other mentors, on your presentation and writing skills.
- Maintain relationships with relevant contacts within and outside of your department, and college.
- Continue to improve your communication skills overall, and seek opportunities to practice your facilitation and teaching skills.
- Compete in 'Say It in 6'—tell your story about your graduate experience.
- Learn how to present your highly technical research to a general, non-technical audience, by attending workshops, conferences, etc.
- Refine your interview skills and be aware of negotiation methods for your job field. The Grad School offers workshops in these areas at various times, https://www.purdue.edu/gradschool/professional-development/workshops/index.php and you can also contact the Center for Career Opportunities, https://www.cco.purdue.edu/ .

Professional Development:

- Continue to monitor the Grad School workshops for opportunities that might help you grow professionally and personally.
- Look for additional opportunities that are available to increase your professional development skills.
- Join an association related to your job field and get involved.

Career Development:

- Identify a few career options that are a match to your skillset, and learn what is necessary to obtain these positions.
- Seek opportunities to mentor younger students or undergraduates.
- Continue acquiring and improving your skills to better match your ideal position.
- Proceed with growing your network, and use these connections as you search for a job.
- Develop a CV and keep it updated and share with relevant connections when appropriate.
- Update your professional online profile, and keep it professional.
- Continue to prepare to thrive in an increasingly diverse global environment.
- Begin the job search and submit applications when ready.

Well-Being:

- Continue to build plans into your schedule to relax and re-energize.
- Once you've secured a job, check out the opportunities in their area—sites to explore, work-out opportunities, social events, etc.

Appendix 1: Self-Assessment of Skillset

This assessment is designed to help you identify your current levels of development in a number of skills and will be reflected in the goals you create in Step 2 of this IDP. The skills listed below will be important to your development as a graduate student and in your future career. Rate your current abilities with these skills from 1 to 5, where 1 indicates low proficiency/limited experience currently and 5 represents a level of mastery.

Skills that are 4-5 should be maintained and honed during your graduate experience, while skills that are 1-3 may need to be addressed and improved upon before graduation. To develop any of these skills further, check out the seminars and workshops offered by The Graduate School that are specifically designed for your professional development.

Communication Skills: Written, Oral, Graphical, Interpersonal:

	1	2	3	4	5
Technical report writing					
Publication & journal article writing					
Grant proposal writing					
Oral presentation of technical research					
Presentation to a general/non-technical audience					
Ability to teach in a classroom setting					
Ability to prepare graphical presentation of data					
Negotiating conflict					
Receiving feedback and constructive criticism					
Providing feedback and constructive criticism					
Fluency in English					
Work effectively with peers and colleagues					
Work effectively with advisor and mentors					

Leadership & Classroom Management:

	1	2	3	4	5
Setting timelines and objectives					
Providing constructive feedback					
Supervising or mentoring researchers					
Running a meeting efficiently to stay on track					
Managing a project budget					
Conducting a classroom lecture					
Conducting a laboratory class					
Preparing and facilitating active learning					
Creating meaningful course assessments					
Preparing a syllabus, measurable course goals					
Designing a course					
Maintaining engagement in distance learning					

Diversity and Inclusion Values:

	1	2	3	4	5
Work with people from various backgrounds					
Work with people from varying cultures/ethnicities					
Demonstrate equitable leadership skills					
Promote a respectful workplace and classroom					
Recognize difference and similarities					
Cultivate relationships with different cultures					
Engage in cultural activities to learn from others					
Consider differences in learning styles					

Research and Scientific Skills:

	1	2	3	4	5
Knowledge within academic field					
Knowledge within specific research area					
Technical skills relevant to your research					
Interpretation of data					
Statistical analysis					
Creativity and innovation, troubleshooting					
Develop advanced skills within your field					
Designing experiments to solve research questions					
Ability to conduct research independently					
Conduct research in a sound, ethical manner					

Personal and Career Development:

	1	2	3	4	5
Balance work and life to maintain motivation					
Maintain physical and mental health					
Manage personal finances					
Engage in community and civic duties					
Participate in service and outreach					
Make contacts and network					
Attend conferences					
Apply for fellowships or grants					
Phone, video, and in-person interview skills					
Prepare a concise resume, cover letter, and CV					
Understand basic job offer negotiation					

Appendix 2: Individual Development Plan for Year 1

For your first year, focus on skills you would like to improve and set achievable goals for the upcoming year. The more specific the goal, the more likely you'll complete it. We've provided an example below, as to how to approach setting up a section of your first IDP. Choose to focus on skills tailored to your path and career goals. You can use the skills listed in Step 1 to guide you, or add your own skills. Following the example below, we've provided a blank form that you can copy and customize to track the various areas you'd like to improve (Research & Scientific Skills, Communication, Leadership & Classroom Management, Diversity & Inclusion Values, Personal & Career Development, etc.) your skills.

Research & Scientific Skills (Example):

Skill	**Importance**	**Opportunities/Goals**
Statistical Analysis	Data should be analyzed to determine if it is statistically consistent and can be reported. Statistical analysis of data should be reported in journal publications.	Take STAT 511 next semester and earn an A, so I am prepared to do statistical analysis when the time comes.
		Take STAT 512 within the next three semesters.
Creativity & Innovation	Creative problem solving is vital in engineering. Improving creativity and innovation approach to research will be beneficial for improving knowledge in my field of study.	Read at least 2-5 journal articles per week to learn how other researchers have approached solving problems.
Ethical Research	If research is not conducted ethically, it is worthless. Everything from safety protocols to consideration of affected individuals must be evaluated.	Attend the Grad School Responsible Conduct of Research workshops. Take notes and revisit them each year.
Technical Skills	In order to collect data, I need to understand how to operate relevant software and instruments. I also need to improve my ability to conduct literature reviews efficiently.	When reading literature, take note of the Methods section to learn about relevant resources in my field.

Skill:_____

Skill	Importance	Opportunities/Goals

Appendix 3: Sample Informational Questions on Research Group Operation/Expectations

- When/where/how often will we meet one-on-one?
- When/where/how often do we meet as a lab group?
- Best way to communicate with your research advisor, and expected response time?
- Best way to communicate with the research group?
- How many students make up the lab group? Are there others who assist, like research staff or does the lab work closely with another professor's lab, etc?
- Will there be meetings with sponsors? If so, what's expected/involved?
- Preferred method for reporting progress or data to your research advisor? (written reports, raw data, calculations and plots, PowerPoint summary, verbal conversation, etc.)
- Expectation for balancing coursework and research responsibilities? What are expected lab working hours?
- What safety/other training required before starting in the lab? How often conducted? How often is it to be renewed?
- What's the chain of command when there's a research question? Do I contact an senior-level lab mate first, or contact research advisor directly?
- Expectation for students to attend and present at conferences?
- Expectation for students to publish papers?
- What kind of positions do your former students hold? Mostly industry, academia, or a mix?
- What is your management style? Does your research advisor meet often with students or prefer them to work more independently?
- Check with your research advisor and lab mates, as to whether there is a standardized reference paper management or citation software to track the literature you are reviewing, that is used by the lab. If not, choose one to use.
- Check with your research advisor and lab mates, as to the method that should be used for filing of data in an organized manner.

Appendix 4: Mentee/Mentor Tips

As you enter your graduate program, you'll want to be seeking various mentors to aid you in your professional and personal growth. Obviously, one will be your research advisor, but others should be members of your advisory and/or examining committees, upper-level graduate students in your research lab, industry professionals, and others you encounter as you build your professional and personal network.

We've listed below some qualities of what makes a good mentee, as well as what makes a good mentor, but neither of these lists, cover all characteristics, but you can use them as a starting point.

Qualities of a good **mentee**, include:

- Be respectful of their mentor's time.
- Advocate for oneself and ensures they have the resources to be successful.
- Ask questions and ask for help when needed, to avoid unnecessary mistakes or delays in progress.
- Work hard to achieve objectives and goals, but takes time to relax and decompress when needed.
- Understand that different career path goals (academia vs. industry) may have different implications on work/life balance flexibility.
- Keep in close communication with mentors and keep them updated on your progress, results, plans.
- Be open, honest, and professional in your communication.

Qualities of a good **mentor**, include:

- Knowledgeable in the field of research you're pursuing, or the skill you're trying to improve, and willing to share their knowledge, expertise, etc.
- Interested in helping you grow, develop, and provides support in various ways.
- Open to various learning styles.
- Able to give constructive feedback.
- Respectful, values diversity of perspectives.
- Good Listener/sounding board.
- Demonstrates positive attitude and acts as a positive role model.
- Values learning and growth.