

ASTRONOMICAL SCIENCES

(HBSc)

Department of Chemical & Physical Sciences

Astronomical Sciences studies the vast universe beyond Earth, discovering objects and phenomena that do not exist on Earth or in the solar system, such as planets orbiting other stars, black holes and forms of mass and energy that cannot be seen even though they form 95% of the universe. To study these objects, astronomical sciences integrates the methods and knowledge of all the other sciences. Astronomical Sciences develops skills leading to careers in:

- Research in astronomy and other fields needing similar methods of measurement and analysis, such as medicine and natural resources.
- Education done in classrooms, science centres and in documentaries for film and television.
- Financial analysis using quantitative methods to understand huge, complex systems.

MAKE THE MOST OF YOUR TIME AT UTM!

We want to help you maximize your university experience, so we've pulled together information and interesting suggestions to get you started, although there are many more! As you review the chart on the inside pages, note that many of the suggestions need not be restricted to the year they are mentioned. In fact, activities such as joining an academic society, engaging with faculty and seeking opportunities to gain experience should occur in each year of your study at UTM. Read through the chart and create your own plan using **My Program Plan** found at www.utm.utoronto.ca/program-plans

Programs of Study (POSt)

- Specialist Program ERSPE1025 Astronomical Sciences (Science)
- Major Program ERMAJ2204 Astronomy (Science)

Check out...

Get ready to delve into astrophysics! In AST320H1, you'll learn about the formation, equilibrium and evolution of the universe, as well as about clusters of galaxies, galaxies, clusters of stars, gas clouds and stars. Have a soft spot for quantum mechanics? Check out JCP321H5, an introduction to the concepts of quantum chemistry and physics.

What can I do with my degree?

The career you choose will depend on your experience and interests. Visit the Career Centre to explore your career options.

Careers for Graduates: Spectral software developer; Radar indicator inspector; Science librarian; Planetarium guide; Science educator; Data scientist; Meteorologist; Optical technician; Laboratory technician; Astronomer.

Workplaces: Communications technology; Government; Scientific instrumentation manufacturing companies; Museums; Observatories and planetariums; Research centres; Space industry.



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SPECIALIST Program Plan

HOW TO USE THIS PROGRAM PLAN

Read through each year. Investigate what appeals to you here and in any other Program Plans that apply to you.

Visit www.utm.utoronto.ca/program-plans to create your own plan using [My Program Plan](#). Update your plan yearly.



	1 ST YEAR	2 ND YEAR
PLAN YOUR ACADEMICS*	<p>Enrol in courses AST110H5; MAT102H5, (MAT135H5, 136H5)/MAT135Y5/ 137Y5/ 157Y5, 223H5/ 240H5; and PHY146H5, PHY147H5.</p> <p>Choose a program of study (Subject POST) once you complete 4.0 credits. Use the Degree Explorer and the Academic Calendar to plan your degree.</p> <p>Start strong and get informed with utmONE and LAUNCH through the Centre for Student Engagement (CSE). Join a RGASC Peer Facilitated Study Group.</p>	<p>Enrol in courses AST221H1(G), 222H1(G); MAT232H5/ 233H5, 236H5, 244H5; PHY241H5, 242H5/ JCP221H5 and JCP245H5.</p> <p>Attend the RGASC's P.A.R.T. to enhance your research skills.</p>
BUILD SKILLS	<p>Use the Co-Curricular Record (CCR). Search for opportunities beyond the classroom, and keep track of your accomplishments.</p> <p>Attend the Get Experience Fair through the Career Centre (CC) to learn about on- and off-campus opportunities.</p>	<p>Use the Career Learning Network (CLNx) to find postings for on- and off-campus work and volunteer opportunities.</p> <p>Work on-campus through the Work-Study program. View position descriptions on the CLNx.</p>
BUILD A NETWORK	<p>Networking simply means talking to people and developing relationships with them. Start by joining the Erindale Chemical and Physical Sciences Society (ECPS). Make sure to go to the ECPS's Meet the Profs Night.</p> <p>Visit the UTM Library Reference Desk.</p>	<p>Do you have a professor you really like or connect with? Ask them questions during office hours. Discuss assignments. Go over lecture material. Don't be shy! Learn Tips On How to Approach a Professor available through the Experiential Education Unit (EEU).</p>
BUILD A GLOBAL MINDSET	<p>Attend events held by the International Education Centre (IEC), whether you are an international or domestic student. Explore your culture and other cultures through weekly/regular conversations, Language Conversation Circles, debates, and activities to enhance your global and intercultural mindset.</p>	<p>Engage in programs like the Global and Intercultural Fluency Training Series (GIFTS) or learn about and prepare for a future UTM Abroad Experience through the IEC to strengthen and enhance your intercultural skill set, and learn about other cultures while sharing your own!</p>
PLAN FOR YOUR FUTURE	<p>Attend the Program Selection & Career Options workshop offered by the Office of the Registrar and the CC.</p> <p>Check out Careers by Major at the CC to see potential career options.</p>	<p>Explore careers through the CC's Job Shadowing Program.</p> <p>Considering further education? Attend the CC's Graduate and Professional Schools Fair. Talk to professors – they are potential mentors and references.</p>

*Consult the Academic Calendar for greater detail on course requirements, program notes and degree requirements.

3 RD YEAR	4 TH OR FINAL YEAR
<p>Enrol in courses AST320H1(G); AST325H1/ JCP265H5/ CSC108H5, JCP321H5, 322H5; MAT311H5, 334H5; PHY325H5 and 347H5.</p> <p>Throughout your undergraduate degree:</p> <ul style="list-style-type: none"> use the Degree Explorer to ensure you complete your degree and program requirements. see the Office of the Registrar and the CPS Academic Counsellor for assistance. 	<p>Enrol in AST425Y1(G); JCP421H5, PHY451H5, and STA220H5/ 256H5. Senior students complete a research project. Speak to the CPS Academic Counsellor to discover available opportunities.</p> <p>Log on to ACORN and request graduation.</p>
<p>Explore your interests. Why not pass on your passion for science? Be a UTM Let's Talk Science Outreach volunteer to support educators and help youth form positive attitudes towards the role that STEM plays in their lives and futures.</p>	<p>Skills are transferrable to any job regardless of where you develop them. Need to strengthen your presentation skills? Consider taking EDS325H5 which allows you to earn a course credit in addition to a placement opportunity as a RGASC Facilitated Study Group Leader.</p>
<p>Establish a professional presence on social media (e.g. LinkedIn Facebook, Twitter or blogs).</p> <p>Learn about local issues! Consider a CSE Alternative Reading Week (ARW) to become engaged with the local community.</p>	<p>Check out the Royal Astronomical Society of Canada Mississauga Centre or Earthshine, an organization that develops and runs astronomy education and public outreach activities in Mississauga.</p> <p>Go to a conference such as the Canadian Space Summit.</p>
<p>Earn credits overseas! Apply to study for a summer, term or year at one of 140+ universities. The CPS department has identified partners which are most relevant to our students. Speak to the IEC for details about Course Based Exchange, funding and travel safety.</p>	<p>Learn about working abroad. Read up on worldwide employment trends and industry outlooks through GoinGlobal. Attend the Go Global Expo. See if you are eligible for International Experience Canada.</p>
<p>What's your next step after undergrad?</p> <p>Entering the workforce? Evaluate your career options through a CC Career Counselling appointment. Create a job search strategy - book a CC Employment Strategies appointment.</p> <p>Considering further education? Research application requirements, prepare for admission tests (LSAT, MCAT), and research funding options (OGS, NSERC).</p>	<p>Market your skills to employers. Get your resume critiqued at the CC. Attend the CC workshop Now That I'm Graduating What's Next?</p> <p>Write a strong application for further education. Attend the CC's Mastering the Personal Statement workshop.</p>

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Skills developed in Astronomical Sciences

To be competitive in the job market, it is essential that you can explain your skills to an employer. Visit the Career Centre to learn how to articulate and market the following skills:

Problem-solving: analyze data and interpret observations and see relationships among factors.

Communication: explain complex concepts and theories to others and clearly explain scientific research and write reports.

Research: define a problem; establish hypotheses; apply and integrate fundamental scientific principles; gather scientific data; and review scientific literature.

Computational: measure distances and sizes; perform complex calculations; and interpret images.

Get involved

Check out the 100+ student organizations on campus. Here are a few:

- Erindale Chemical and Physical Sciences Society (ECPS)
- UTM Student Union (UTMSU)
- UTM Athletics Council (UTMAC)

For a listing of clubs on campus visit www.utm.utoronto.ca/clubs.

Services that support you

- Accessibility Services (AS)
- Career Centre (CC)
- Centre for Student Engagement (CSE)
- Experiential Education Unit (EEU)
- Health & Counselling Centre (HCC)
- Indigenous Centre (IC)
- International Education Centre (IEC)
- Office of the Registrar (OR)
- Recreation, Athletics and Wellness Centre (RAWC)
- Robert Gillespie Academic Skills Centre (RGASC)
- UTM Library, Hazel McCallion Academic Learning Centre (HMALC)

Department of Chemical & Physical Sciences

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FUTURE STUDENTS

Admission to UTM

All program areas require an Ontario Secondary School Diploma, or equivalent, with six Grade 12 U/M courses, or equivalent, including English. Your admission average is calculated using English plus your next best five courses. The Grade 12 prerequisites for Astronomical Sciences are Advanced Functions and Physics. The approximate average required for admission is mid- to high-70s. More information is available at utm.utoronto.ca/viewbook.

NOTE: During the application process, applicants will select the Chemical & Physical Sciences admissions category but will not officially be admitted to a formal program of study (Specialist, Major, and/or Minor) until after first year.

Sneak Peek

Would you like to understand more fully the celestial phenomena visible to the naked eye? AST110H5 gives a quantitative, scientific introduction to observing objects that can be seen with the naked eye or with binoculars. Discover the beauty of proofs in MAT102H5! You will learn to understand, use and develop precise expressions of mathematical ideas, including definitions and theorems.

In CPS, our students have access to new, state-of-the-art teaching laboratories and are involved in cutting-edge research projects in our research labs.

Student Recruitment & Admissions

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Mississauga ON Canada L5L 1C6

905-828-5400

www.utm.utoronto.ca/future-students

