**Suggested First-Year Schedule**

**Fall** | **Spring**
---|---
FYSEM 1010 | FYW 1120
PHYS 1230 | PHYS 1240
MATH 1170 | MATH 1180
CHEM 1130 | CHEM 1140
or elective | or elective
*CHEM 1500 counts as CHEM 1130 & CHEM 1140.*

The following information, and much more, can be found on our departmental website:

https://www.hamline.edu/cla/physics/

---

**Physics Degree Options**

---

**Bachelor of Science (BS) Degree**

This major is intended for students planning to proceed to graduate work in either physics or engineering. It focuses on both high-level physics courses and providing a breadth of science education.

**Bachelor of Arts (BA) Degree**

This major is intended for students who wish to double major in other disciplines. It is also a major that can be done in three years for those who decide late.

**Minor**

The minor is intended for students with an interest in physics, but do not intend to pursue a career in physics or engineering. Having a physics minor on the transcript can help the transcript stand out for students interested in proceeding to medical school, or a career in patent law, for example.

---

**Applied Physics Degree Options**

please refer to bulletin for specific course requirements

---

**BS in Applied Physics with an Emphasis in Engineering**

This track is intended for students interested in pursuing a career in engineering, whether or not they intend to proceed to graduate school (please see the next panel regarding the benefits of getting a physics degree in working toward a career in engineering). While many of our graduates have historically gone into engineering fields, this track was established to ease this transition.

**BS in Applied Physics with an Emphasis in Materials Science**

This track is intended for students interested in pursuing a career in materials science, typically by proceeding from Hamline to graduate school. We have had many physics majors proceed to graduate school at UMN in Materials Science. This track was established to ease this transition.

**BA in Applied Physics with an Emphasis in Computation**

This track is intended for students interested in physics, but who seek careers that utilize their scientific background in a way that involves computation. Examples include students interested in signal processing, computational modeling, actuarial jobs, etc.

**BA in Applied Physics with an Emphasis in Innovation**

This track is intended for students interested in using their scientific background to either start their own, or fit well into an existing innovative company or organization.

---

**Innovation Studies**

In 2015, the physics department established a course in Innovation Studies, spearheaded by Hamline Physics alum Roger Appeldorn ('57, right), a leading innovator throughout his career at 3M. For more information about Innovation Studies at Hamline, please see the Physics webpage.

---

**Why a Physics Degree is a Great Start to a Career in Engineering**

There are a few serious benefits to doing a physics degree first, then choosing the field of engineering in graduate school:

- **Physics provides students with a general problem solving background that prepares students well for any field of engineering.** It is actually quite common for a student to begin college thinking they want to do one type of engineering, but switch to another. This is usually quite difficult because the fields are so specialized, but students going from physics to engineering are almost always successful (our recent graduates haven’t had more difficulty than a short transition period, then they were typically ahead of the rest).

- **Having only an undergraduate degree in engineering can get someone a job, but having a master’s degree in engineering can often allow you to go much further with a company than you could with the bachelor’s alone.** Having a physics background, too, especially at a liberal arts school like Hamline, helps tremendously with advancement. In addition to the problem solving skills, we focus so much on students working in groups, giving presentations, etc., that we always get good feedback about our students’ interview skills and ability to work with others.

- **If there is any chance that a student might switch engineering fields, just having that four years of time while doing the physics degree gives time to better explore those engineering fields.**

Most of our graduates go to graduate school in some type of engineering, so we definitely see evidence for all of this. We would be happy to answer questions from prospective students, show them around the department, or put them in contact with recent graduates that have gone on to careers in physics or engineering.
Dr. Jerry Artz  
Professor, Radiation Safety Officer, MIAC Faculty Rep.  
*University of Cincinnati B.S.  
*Stanford University M.S.  
*Florida State University Ph.D.  
Contact: (651) 523-2256  
jartz@hamline.edu  
Research interests: nuclear physics and energy; alternate energy resources; energy policy; physics of the environment; radiation safety.  
Personal interests: tennis; music; the arts.

Dr. Bruce Bolon  
Professor  
*Missouri State University B.S.  
*Iowa State University M.S.  
*University of Missouri-Columbia Ph.D.  
Contact: (651) 523-2192  
bbolon@hamline.edu  
Research interests: magnetic properties of multilayered thin films; determining the suitability of various materials for potential use in spintronic devices.  
Personal interests: Playing, writing & listening to music; baseball; high fantasy books; playing cards; D&D; racquetball; and playing with his daughter, Tia.

Dr. Lifeng Dong  
Emma K. and Carl R. N. Malmstrom Endowed Chair in Physics  
Professor, Department Chair  
*Qingdao University of Science and Technology B.S., M.S.  
*Portland State University M.S., Ph.D.  
Contact: (651) 523-2634  
ldong03@hamline.edu  
Research interests: nanoscale materials & devices (i.e., solar cells, supercapacitors, batteries, fuel cells, biosensors)  
Personal interests: swimming, reading

Dr. Benjamin Gold  
Laboratory Coordinator & Instructor  
*Michigan State University B.S.  
*University of California, Davis Ph.D.  
Contact: (651) 523-3056  
bgold01@hamline.edu  
Research interests: cosmology; statistics & data analysis; early universe physics  
Personal interests: electronic music; games with my daughter

Dr. Andy Rundquist  
Professor, Associate Dean of CLA  
*Saint Johns University (MN) B.A.  
*Washington State University M.S., Ph.D.  
Contact: (651) 252-1778  
arundquist@hamline.edu  
Research interests: ultrafast optical pulse generation, characterization, and optimization; next-generation particle accelerators; modeling.  
Personal interests: jazz trombone; guitar; disc golf; playing with his 3 boys.

Dr. Kevin Stanley  
Lecturer  
*University of Idaho B.S.  
*Clemson University M.S.  
*Iowa State University Ph.D.  
Contact: (651) 523-3060  
mstanley01@hamline.edu  
Research interests: condensed matter physics; quantum mechanical effects in surface physics; field emission.  
Personal interests: Magic: The Gathering; strategic board (and computer) games.

Dr. Richard Pontinen  
Emeritus Professor of Physics  
*Hamline University B.A.  
*University of Minnesota PhD  
Personal interests: golf in the spring, golf in the summer, golf in the fall, and, of course, golf in the winter.  
Dr. Pontinen maintains strong ties to the physics department and the university as a whole. The scholarship he generously established continues to provide funding for several students each year.

Dr. Andy Rundquist  
Professor, Associate Dean of CLA  
*Saint Johns University (MN) B.A.  
*Washington State University M.S., Ph.D.  
Contact: (651) 252-1778  
arundquist@hamline.edu  
Research interests: ultrafast optical pulse generation, characterization, and optimization; next-generation particle accelerators; modeling.  
Personal interests: jazz trombone; guitar; disc golf; playing with his 3 boys.

Dr. Kevin Stanley  
Lecturer  
*University of Idaho B.S.  
*Clemson University M.S.  
*Iowa State University Ph.D.  
Contact: (651) 523-3060  
mstanley01@hamline.edu  
Research interests: condensed matter physics; quantum mechanical effects in surface physics; field emission.  
Personal interests: Magic: The Gathering; strategic board (and computer) games.

Dr. Richard Pontinen  
Emeritus Professor of Physics  
*Hamline University B.A.  
*University of Minnesota PhD  
Personal interests: golf in the spring, golf in the summer, golf in the fall, and, of course, golf in the winter.  
Dr. Pontinen maintains strong ties to the physics department and the university as a whole. The scholarship he generously established continues to provide funding for several students each year.

Dr. Andy Rundquist  
Professor, Associate Dean of CLA  
*Saint Johns University (MN) B.A.  
*Washington State University M.S., Ph.D.  
Contact: (651) 252-1778  
arundquist@hamline.edu  
Research interests: ultrafast optical pulse generation, characterization, and optimization; next-generation particle accelerators; modeling.  
Personal interests: jazz trombone; guitar; disc golf; playing with his 3 boys.

Dr. Kevin Stanley  
Lecturer  
*University of Idaho B.S.  
*Clemson University M.S.  
*Iowa State University Ph.D.  
Contact: (651) 523-3060  
mstanley01@hamline.edu  
Research interests: condensed matter physics; quantum mechanical effects in surface physics; field emission.  
Personal interests: Magic: The Gathering; strategic board (and computer) games.

Dr. Richard Pontinen  
Emeritus Professor of Physics  
*Hamline University B.A.  
*University of Minnesota PhD  
Personal interests: golf in the spring, golf in the summer, golf in the fall, and, of course, golf in the winter.  
Dr. Pontinen maintains strong ties to the physics department and the university as a whole. The scholarship he generously established continues to provide funding for several students each year.

Dr. Andy Rundquist  
Professor, Associate Dean of CLA  
*Saint Johns University (MN) B.A.  
*Washington State University M.S., Ph.D.  
Contact: (651) 252-1778  
arundquist@hamline.edu  
Research interests: ultrafast optical pulse generation, characterization, and optimization; next-generation particle accelerators; modeling.  
Personal interests: jazz trombone; guitar; disc golf; playing with his 3 boys.

Dr. Kevin Stanley  
Lecturer  
*University of Idaho B.S.  
*Clemson University M.S.  
*Iowa State University Ph.D.  
Contact: (651) 523-3060  
mstanley01@hamline.edu  
Research interests: condensed matter physics; quantum mechanical effects in surface physics; field emission.  
Personal interests: Magic: The Gathering; strategic board (and computer) games.

Dr. Richard Pontinen  
Emeritus Professor of Physics  
*Hamline University B.A.  
*University of Minnesota PhD  
Personal interests: golf in the spring, golf in the summer, golf in the fall, and, of course, golf in the winter.  
Dr. Pontinen maintains strong ties to the physics department and the university as a whole. The scholarship he generously established continues to provide funding for several students each year.

Dr. Andy Rundquist  
Professor, Associate Dean of CLA  
*Saint Johns University (MN) B.A.  
*Washington State University M.S., Ph.D.  
Contact: (651) 252-1778  
arundquist@hamline.edu  
Research interests: ultrafast optical pulse generation, characterization, and optimization; next-generation particle accelerators; modeling.  
Personal interests: jazz trombone; guitar; disc golf; playing with his 3 boys.

Dr. Kevin Stanley  
Lecturer  
*University of Idaho B.S.  
*Clemson University M.S.  
*Iowa State University Ph.D.  
Contact: (651) 523-3060  
mstanley01@hamline.edu  
Research interests: condensed matter physics; quantum mechanical effects in surface physics; field emission.  
Personal interests: Magic: The Gathering; strategic board (and computer) games.

Dr. Richard Pontinen  
Emeritus Professor of Physics  
*Hamline University B.A.  
*University of Minnesota PhD  
Personal interests: golf in the spring, golf in the summer, golf in the fall, and, of course, golf in the winter.  
Dr. Pontinen maintains strong ties to the physics department and the university as a whole. The scholarship he generously established continues to provide funding for several students each year.

Dr. Andy Rundquist  
Professor, Associate Dean of CLA  
*Saint Johns University (MN) B.A.  
*Washington State University M.S., Ph.D.  
Contact: (651) 252-1778  
arundquist@hamline.edu  
Research interests: ultrafast optical pulse generation, characterization, and optimization; next-generation particle accelerators; modeling.  
Personal interests: jazz trombone; guitar; disc golf; playing with his 3 boys.

Dr. Kevin Stanley  
Lecturer  
*University of Idaho B.S.  
*Clemson University M.S.  
*Iowa State University Ph.D.  
Contact: (651) 523-3060  
mstanley01@hamline.edu  
Research interests: condensed matter physics; quantum mechanical effects in surface physics; field emission.  
Personal interests: Magic: The Gathering; strategic board (and computer) games.

Dr. Richard Pontinen  
Emeritus Professor of Physics  
*Hamline University B.A.  
*University of Minnesota PhD  
Personal interests: golf in the spring, golf in the summer, golf in the fall, and, of course, golf in the winter.  
Dr. Pontinen maintains strong ties to the physics department and the university as a whole. The scholarship he generously established continues to provide funding for several students each year.

Dr. Andy Rundquist  
Professor, Associate Dean of CLA  
*Saint Johns University (MN) B.A.  
*Washington State University M.S., Ph.D.  
Contact: (651) 252-1778  
arundquist@hamline.edu  
Research interests: ultrafast optical pulse generation, characterization, and optimization; next-generation particle accelerators; modeling.  
Personal interests: jazz trombone; guitar; disc golf; playing with his 3 boys.

Dr. Kevin Stanley  
Lecturer  
*University of Idaho B.S.  
*Clemson University M.S.  
*Iowa State University Ph.D.  
Contact: (651) 523-3060  
mstanley01@hamline.edu  
Research interests: condensed matter physics; quantum mechanical effects in surface physics; field emission.  
Personal interests: Magic: The Gathering; strategic board (and computer) games.

Dr. Richard Pontinen  
Emeritus Professor of Physics  
*Hamline University B.A.  
*University of Minnesota PhD  
Personal interests: golf in the spring, golf in the summer, golf in the fall, and, of course, golf in the winter.  
Dr. Pontinen maintains strong ties to the physics department and the university as a whole. The scholarship he generously established continues to provide funding for several students each year.