

## **Mission Statement**

The College of Science and Mathematics is dedicated to excellence in undergraduate education and research. Our outstanding programs are student-centered and designed to prepare students for responsible positions at all levels in research, industry, education, medicine and government. We emphasize learning by doing science and provide active learning experiences in a range of settings. We also encourage collaborative research with faculty, internships and other experiences that facilitate transitions to work or graduate/professional education.

- We provide foundational understanding of science and mathematics for the educated citizen.
- We provide an exemplary program in mathematics and science for prospective teachers.
- We provide the educational basis and technical skills to prepare science and mathematics students for the workforce.
- We provide the theoretical and practical foundations for success in professional and graduate programs.

## **Science and Mathematics Programs**

The college offers a variety of academic programs, majors, minors, concentrations, interdisciplinary programs and tracks. Most of these are listed below. For an explanation and contact point of each, visit our Web site at <http://csm.jmu.edu/>

- Actuarial/Financial Mathematics
- American Chemical Society Accredited Program
- Applied Chemistry/Chemical Engineering Program
- Applied Physics
- Biochemistry Minor In Biology or Chemistry
- Biology Major
- Biology Minor
- Biotechnology
- Chemical Education Concentration
- Chemistry Major
- Chemistry Minor
- Chemistry/Business Concentration
- Computational and Applied Mathematics
- Computational Sciences
- Pre-dentistry
- Earth Resources
- Ecology
- Environmental and Engineering Geology
- Environmental Studies Minor
- Forestry
- Fundamental Studies In Physics
- Geology Major
- Geology Minor
- Materials Chemistry Major
- Materials Science Program
- Mathematics Major
- Mathematics Minor
- Medical Technology
- Pre-Medicine
- Microbiology
- Molecular Biology and Physiology
- Pre-Optometry
- Pre-Pharmacy
- Physics Major
- Physics Minor
- Physics/Engineering Combined Program
- Plant Sciences
- Pure Mathematics
- Statistics Major
- Statistics Minor

- Teaching Licensure for Secondary Teaching Available in:
  - Biology
  - Chemistry
  - Earth Sciences
  - Mathematics
  - Physics
- Pre-Veterinary Medicine
- Zoology

Some of these interdisciplinary programs are listed under “Interdisciplinary Programs” beginning on Page 75. These include: the biochemistry and molecular biology minor, the environmental studies minor, the materials science program, and Pre-Health areas such as pre-medical and pre-dental. The college also supports the following resource and service centers, collections, events and outreach programs that enhance teaching, scholarly activity and community relations.

## **Resource and Service Centers**

### **The Center for Computational Mathematics and Modeling**

This interdisciplinary institute for scientific computing, houses state-of-the-art graphics workstations and a 16 PII node beowulf computer system. The beowulf computer system is a parallel computing environment that can be used on large scale problems. Faculty and students will have access to this ‘super computer’ from the center and from their offices. The center also operates an Immersive 360° Visualization System. The center uses mathematics both to simulate real-world phenomena and to generate visual data. Faculty members from the sciences, economics, and business disciplines interact with mathematicians to model problems that they are researching with undergraduate students. For further information, contact Dr. James Sochacki in the Department of Mathematics and Statistics at (540) 568-6614.

### **Electron Microscopy Center**

The Electron Microscopy Center serves faculty, staff and students who wish to use the scanning electron microscopy in scientific investigations. The center also provides demonstrations for public school groups and specialized educational programs. For further information, contact Lance Kearns in the Department of Geology and Environmental Science at (540) 568-6421.

### **Mineral Museum**

Housed with the Department of Geology on the second floor of Miller Hall, the JMU Mineral Museum contains more than 700 exceptionally beautiful display specimens that provide mineralogy students with outstanding visual examples of some of the finest crystals from around the world. Each year, numerous educational groups, mineralogical societies and individual collectors visit the collection. For further information contact Dr. Lance E. Kearns in the Department of Geology and Environmental Studies at (540) 568-6421/6130.

### **Observatory**

Located at the Stokesville, Virginia Campground, a 14-inch telescope is permanently mounted under a 16-foot dome. A set of 10 piers surround the observatory building and provide easy set-up for the observatory’s eight, 8-inch telescopes. This site provides dark-sky observing for introductory astronomy students. A photometer, solar filters and a CCD imaging system provides more advanced students with experience in astrophotography and data collection techniques. During the summer months, public access is regularly available on Friday and Saturday nights. For further information, contact Dr. Jon Staib in the Department of Physics at (540) 568-6153.

### **Office of Statistical Services**

Through this office, statistics faculty members and students provide JMU and the local community with assistance in the design and analysis of statistical surveys and experiments. Students obtain practical experience and an appreciation for the impact of statistical methods on today’s society. For further information contact Dr. Rickie Domangue in the Department of Mathematics and Statistics at (540) 568-6968.

### **Shenandoah Valley Regional NMR Facility**

This nuclear magnetic resonance facility has been established with grants from The National Science Foundation (9650132), The Merck Foundation, and matching funds provided by James Madison University, Eastern Mennonite University, and Bridgewater College.

It includes a Bruker Avance DRX-400 NMR, equipped with a six position autosampler, a variable temperature 10mm broad band tunable probe, variable temperature 5mm broad band tunable probe with a Z gradient, and an SGIO2 host computer.

The Facility also has a Bruker AMX-200 NMR controlled with an SGI computer. This system is equipped with a 5mm broad band tunable probe and VT accessory. The autosampler purchased for the DRX-400 will operate on the AMX-200. These instruments are housed at JMU and accessed remotely by the participating regional colleges and universities. Currently the systems are running XWIN-NMR version 2.5 software.

A Web site, <http://csm.jmu.edu/nmr/>, has been established as a means of communicating the efforts of the Regional NMR Consortium to the local scientific community and other interested parties. This group is composed of chemists from Bridgewater College, Eastern Mennonite University, James Madison University, and Mary Baldwin College.

## **Science and Mathematics Learning Center**

The College of Science and Mathematics has established a Learning Center for Science and Mathematics located in the first floor of Wilson Hall. The center, which is a part of the JMU Student Success Center, provides extra help with math and science for students in general education and beginning science courses. The center is staffed by two full-time directors and carefully selected upper level science and math majors.

## **Wells Planetarium**

The John C. Wells Planetarium provides basic instructions in astronomy to JMU's undergraduate students. The planetarium offers instructional and entertaining programs to school groups by appointment. The planetarium also has regular Monday evening programs that are open to the local community. For further information, contact the Department of Physics at (540) 568-7827 or (540) JMU-STAR.

## **Annual Events**

### **Mathematics Contests**

Each fall the mathematics and statistics department sponsors a valley-wide mathematics contest. The purposes of the contest are to create and to sustain interest in mathematics and to promote good relations and cooperation between high schools and the university. For further information, contact Charles Ziegenfus or Dr. Robert Hanson in the Department of Mathematics and Statistics at (540) 568-6408.

### **Science Fair**

The Shenandoah Valley Regional Science Fair has been administered by the JMU science faculty for the past 36 years. The science fair is a competition open to all students in grades six through 12 who live in Virginia's Shenandoah Valley. For further information, contact Dr. Thomas DeVore in the Department of Chemistry at (540) 568-7938.