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Computational Mathematics Majors

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Department of Mathematical and Statistical Sciences

INTRODUCTION

The computational mathematics curriculum is a program of study offered by the Department of Mathematical and Statistical Sciences that blends the subjects of computer science and applied mathematics. The program is designed to provide a balance between mathematics and computer science that would otherwise require a double major to achieve. It includes those courses in the mathematics curriculum that emphasize applied mathematics as well as those from the computer science curriculum that develop the computing skills required by many of today's applications.

CAREER OPPORTUNITIES

The curriculum in computational mathematics produces graduates who are uniquely positioned for careers in today's technical environment. Such careers vary greatly in one's day-to-

REQUIREMENTS FOR THE COMPUTATIONAL MATHEMATICS MAJOR

R E Q U I R E D   C O U R S E S

All students must take the following eight mathematics courses:

MATH 1450	Calculus 1	4 sem. hrs.
MATH 1451	Calculus 2	4 sem. hrs.
MATH 2350	Foundations of Mathematics	3 sem. hrs.
MATH 2450	Calculus 3	4 sem. hrs.
MATH 2451	Differential Equations	4 sem. hrs.
MATH 3100	Linear Algebra & Matrix Theory	3 sem. hrs.
MATH 4540	Numerical Analysis	3 sem. hrs.
MATH 4630	Mathematical Modeling and Analysis	3 sem. hrs.
MATH 4720	Statistical Methods	3 sem. hrs.
or MATH 4740.	Biostatistical Methods and Models	3 sem. hrs.

and the following four COSC courses:

COSC 1010	Introduction to Computer Programming	4 sem. hrs.
COSC 1020	Object-Oriented Software Design	4 sem. hrs.
COSC 2100	Data Structures & Algorithms 1	3 sem. hrs.
COSC 3100	Algorithms	3 sem. hrs.

In addition, all students must take two of the following MATH courses:

MATH 3570	Introduction to Data Science	3 sem. hrs.
MATH 4200	Intermediate Analysis 1	3 sem. hrs.
MATH 4210	Complex Variables	3 sem. hrs
MATH 4500	Theory of Differential Equations	3 sem. hrs.
MATH 4510	Elementary Partial Differential Equations	3 sem. hrs.
MATH 4650	Theory of Optimization	3 sem. hrs.
MATH 4670	Applied Combinatorial Mathematics	3 sem. hrs
MATH 4700	Theory of Probability	3 sem. hrs.
MATH 4710	Mathematical Statistics	3 sem. hrs.
MATH 4760	Time Series	3 sem. hrs
MATH 4780	Regression Analysis	3 sem. hrs

and one of the following COSC courses:

COSC 3090	Bioinformatics Algorithms	3 sem. hrs.
COSC 3250	Operating Systems	3 sem. hrs.
COSC 3410	Programming Languages	3 sem. hrs.
COSC 3570	Introduction to Data Science	3 sem. hrs.
COSC 3810	Software Design and Analysis	3 sem. hrs.
COSC 4600	Fundamentals of Artificial Intelligence	3 sem. hrs.
COSC 4610	Data Mining	3 sem. hrs.

Computational Mathematics Major
SAMPLE CURRICULUM[4]

Freshman

First Term	Sem. Hrs.	Second Term	Sem. Hrs.

STUDENT COMPUTING FACILITIES

Katherine Reed Cudahy Hall houses the University's Information Technology Service (ITS) central computing facilities on the second floor, and MSSC department computing facilities on the first, third and fourth floors.

Marquette students, faculty and staff are granted accounts on the Emarq and CheckMarq systems maintained by ITS. Authentication credentials can be obtained from the ITS Help Desk (room CU 293) and are maintained throughout a student's enrollment at Marquette. Additional information regarding University computing facilities can be obtained by calling the ITS Help Desk at 288-7799.

The MSSC Department maintains its own independent computing facilities for both teaching and research purposes. Students enrolled in MSSC courses or as department majors are granted access to general purpose laboratories in CU 101, CU 310, and CU 412. In addition, students enrolled in particular courses or involved in research projects may be granted access to special-purpose laboratories in CU 145, CU 301, CU 310, CU 368, CU 392, or CU 410.

The MSSC network features Gigabit internal connectivity between seven subnets with a wide variety of computing hardware and operating systems. Solaris and Linux servers provide centralized file, mail, web and print services to Windows, Linux, Solaris and Mac clients. Computer configurations range from an in-desk PC classroom to laboratories of dual-head workstations for collaborative project work.

Although students may have their own computer equipment, the MSSC department provides sufficient facilities for all MSSC coursework. Students are encouraged to make use of department facilities; experience with heterogeneous environment provide