Courses in Mathematics, Statistics, and Computer Science for All Students

Table 1 below provides information on courses in mathematics, statistics, and computer science (MSCS) that are *required* for various majors and concentrations.

Students in many disciplines can benefit from MSCS courses, even if they are not required. Indeed, a large proportion of respondents to the *HEDS Consortium Alumni Survey (class of 2002)* indicated that additional coursework in MSCS topics would have been beneficial. Table 2 gives an incomplete sampling of disciplines where MSCS courses have proved useful. Students are encouraged to discuss with their advisors and appropriate chairs and program directors which MSCS courses could aid their St. Olaf studies and post-graduation careers.

Note that *CIR* refers to the Center for Interdisciplinary Research at the College.

Table 1: Majors and concentrations *requiring* MSCS courses

Academic Area	Major/Concentration	Required Courses
Fine Arts		None
Humanities		None
Interdisciplinary and General Studies	Environmental Studies	MATH 120* for NS track
Natural Sciences and Mathematics	Biology	MATH 120*
	Biomolecular Science	MATH 120*
	Chemistry	MATH 120 and 126/128
	Chemistry (ACS major)	MATH 220 and at least one of MATH 226 or 230
	Computer Science	See major requirements
	Mathematics	See major requirements
	Mathematical Biology	MATH 120, 220 and 236
	Physics	MATH 120, 126/128, 220, 226, and 230
	Psychology	STAT 110 or 212
	Statistics	See concentration requirements
Social Sciences	Economics	MATH 120 and STAT 263 or (STAT 272 + Econ 385)
	Sociology/Anthropology	STAT 110

*MATH 120 is required because it is a pre-requisite for CHEM 126

Table 2: An incomplete list of examples of disciplinary use of MSCS courses

Academic Area	Discipline	MSCS Courses	Notes
Fine Arts	Art & Art Hist	CSCI 121	Could be good for those interested in new media arts.
Humanities	*Many disciplines*	*STAT 110, CSCS 121*	*Sections of CSCI 121 often have a digital humanities focus. STAT 110 can be useful for research. See ex's below.*
	English and Norwegian	STAT 110	A CIR project used statistics to analyze stylistic variation in the original and translations in O.E. Rolvaag's novels.
	History	STAT 110	A CIR project analyzed historical demographic data relevant to an examination of Alabama after the Civil War.
Interdisciplinary and General Studies (IGS)	*Many disciplines*	*STAT 110 and CS 121*	*Except for Environmental Studies, most students in IGS disciplines will be best served by stats and comp sci than by math. Consult advisors and the appropriate program directors.*
	Env. Studies (NS)	STAT 212 or 272	Recommended in the catalog for the Nat. Sci. track.
	''	CSCI 125	Ongoing research project uses Beowulf cluster to simulate riparian plant zones.
	Env. Studies (SS)	STAT 110, 212, 263, or 272	Recommended in the catalog for the Soc. Sci. track.
	Linguistic Studies	STAT/MSCS 390	Approved for the concentration, but has statistics prerequisites—see the Stats and Linguistics program directors.
	''	CSCI 121/125, 251, 276, 333	Approved for the concentration, with some restrictions – see the CS and Linguistics program directors.
Natural Sciences and Mathematics (NSM)	*All disciplines*	*Math, Stats, and CS (esp. CSCS 125) courses*	*All students in the NSM can benefit from the study of math, stats, and comp sci. STAT 212 and CSCI 125 are designed for NSM students. Consult advisors and program directors for recommendations and see a few examples below.*
	Biology	MATH 230	Differential equations are used to model biological systems. MATH 126 and 220 are prerequisites.
	''	STAT 212, 272, 285	A CIR project used longitudinal tree size and mortality data to develop and analyze tree growth curves for help in restoration projects.
	''	CSCI 125, 315	Bioinformatics is an emerging field that combines biology and comp. sci.
	Biomedical Studies	See Biology rec's	Consult advisor and program director.
	Biomolecular Sci.	See Biology rec's	Consult advisor and program director.
	Chemistry	See Biology rec's	Consult advisor and department chair.
	Comp. Sci.	MATH 120, 126, 220, 226, 232, 252	These courses are useful for improving logic and visualization skills.
	''	STAT 110 or 212	

	Mathematical Biology	MATH 230, 236, 242, 330; STAT 212, 282; CSCI 125, 315	MATH 236 is required for the concentration; the rest of the courses are electives
	Neuroscience	MATH 230, 236, 330	Knowledge of linear algebra and differential equations are helpful in understanding neural dynamics. These courses are approved for elective credit in the concentration but have 120, 126, and 220 as prerequisites
	"	STAT 212 or 272	A CIR project used statistics to study neuron classification related to light sensitivity in eyes.
	Physics	MATH 242, 262, 330, 340, 384	Further study of mathematics can help with graduate studies in physics.
	"	STAT 212, 272	Along with Probability (MATH 262) knowledge of statistics is good for Statistical Mechanics.
	"	CSCI 125, 241, 251	Knowledge of computer science can be helpful for graduate studies in physics.
	Psychology	STAT 272	Further study of statistics may be useful for graduate studies.
	Statistics	MATH 220, 226, 244, 262, 344, 390	These courses will be useful for anyone planning graduate studies in statistics.
Soc. Sciences	Economics	MATH 126/128, 220, 226, 230, 244	Studying differential equations (230) and real analysis (244) are essential for graduate studies in economics.
	"	STAT 212, 272	A CIR project used statistics to examine the effect of U.S. rice subsidies on the Costa Rican rice market.
	Education or Educational Studies	STAT 110	A CIR project used hierarchical linear models to analyze longitudinal writing data to determine whether or not students made adequate writing progress.
	Exercise Science	STAT 110	A CIR project used statistics to study the effect of coaches' timeouts in college volleyball.
	Social Work	STAT 110	Recommended AQR course, especially if considering graduate studies.
	Nursing	STAT 110	Recommended AQR course, especially if considering graduate studies.
	Political Science	CSCI 121	A research project used the Beowulf cluster to analyze political blogs.
Pre-professional	Accounting	MATH 120, 126	Strongly recommended
	"	Stats, CS courses	Strongly recommended
	Architecture	MATH 120, 126	Strongly recommended
	Computer Eng.	STAT 212, CS courses	Strongly recommended
	Dentistry	MATH 120, STAT 212	Strongly recommended
	Info. Tech.	CS courses	Strongly recommended
	Medicine	MATH 120, STAT 212	Strongly recommended
	Occ. Therapy	STAT 110 or 212	Strongly recommended
	Pharmacy	MATH 120, STAT 110	Strongly recommended
	Phy. Therapy	MATH 120, STAT 110	Strongly recommended
	Software Eng.	STAT 212, CS courses	Strongly recommended
	Vet. Medicine	MATH 120, STAT 212	Strongly recommended