

UNIVERSITY
HELEN WAY KLINGLER
COLLEGE OF ARTS AND SCIENCES

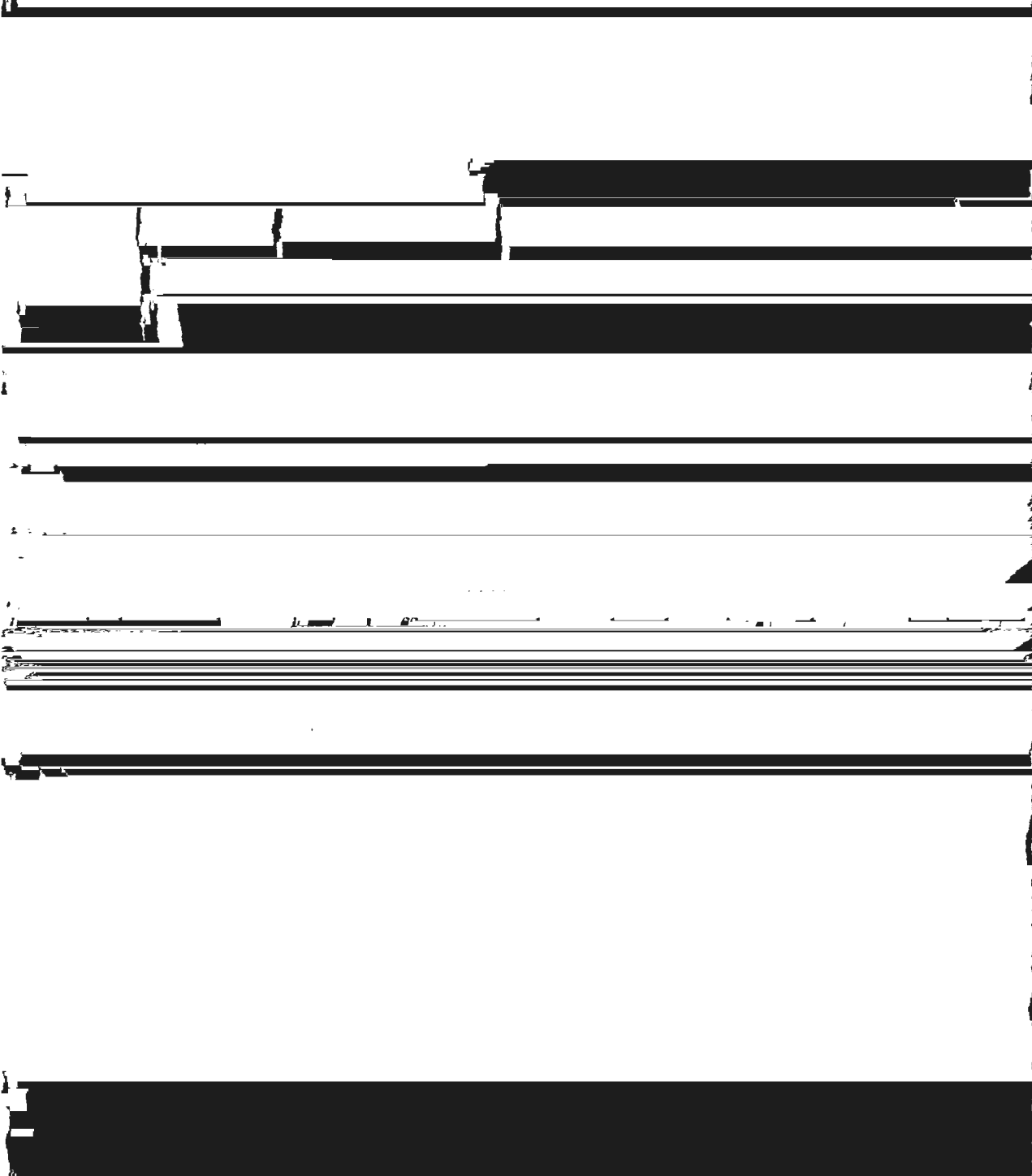
for

2017-2018

Department of Mathematics, Statistics and Computer Science

INTRODUCTION

The bioinformatics major (INBI) is an interdisciplinary program between the Department of Mathematics, Statistics and Computer Science, and the Department of Biological Sciences. Bioinformatics is a field that lies at the intersection of biology, statistics, and computer science and is focused on the generation and analysis of large biological datasets. With the advent of high throughput technologies to generate vast amount of biological data, bioinformatics has become a vital area in the life sciences. Over the next two decades, such “big data” has become



REQUIREMENTS FOR THE BIOINFORMATICS MAJOR (INBI)

REQUIRED COURSES

All students must take the following thirteen courses:

BIOL 1001	General Biology 1	3 sem. hrs.
BIOL 1002	General Biology 2	3 sem. hrs.
BIOL 2201	Genetics	3 sem. hrs.
BIOL 2301	Cell Biology	3 sem. hrs.
BIOL 4101	Biochemistry and the Molecular Basis of Biology	3 sem. hrs.
BIOL 4201	Genomics and Bioinformatics	3 sem. hrs.
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 4610	Data Mining	3 sem. hrs.
COSC 4800	Principles of Database Systems	3 sem. hrs.
COSC xxxx	Bioinformatics Capstone	3 sem. hrs.

In addition, students must take the following three mathematics courses:

MATH 1450	Calculus 1	4 sem. hrs.
MATH 2100/2350	Discrete Mathematics or Foundations of Mathematics	3 sem. hrs.
MATH 4740/4720	Biostatistical Methods and Models, or Statistical Methods	3 sem. hrs.

In addition, students must take two of the following laboratory courses

BIOL 1101	Laboratory	3 sem. hrs.
BIOL 3202	Laboratory	3 sem. hrs.
BIOL 3302	Experimental Cell Biology	3 sem. hrs.
BIOL 4102	Experimental Molecular Biology	3 sem. hrs.

Bioinformatics Major SAMPLE CURRICULUM

Freshman

<u>Fall Term</u>	<u>Sem. Hrs.</u>	<u>Spring Term</u>	<u>Sem. Hrs.</u>
BIOL 1001	3	BIOL 1002	3
COSC 1010	4	COSC 1020	4
ENGL 1001	3	ENGL 1002	3
MATH 1450	4	MATH 2100	3
		UCCS – Histories of Cult./Soc.3	3
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	14		16

Sophomore

<u>Fall Term</u>	<u>Sem. Hrs.</u>	<u>Spring Term</u>	<u>Sem. Hrs.</u>
BIOL 2301	3	BIOL 2201	3
CHEM 1001 or CHEM 1013	4	CHEM 1002 or CHEM 1014	4
MATH 4720	3	COSC 2100	3
THEO 1001	3	PHIL 1001	3
UCCS-Ind. & Social Behavior	3	Elective	3
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	16		16

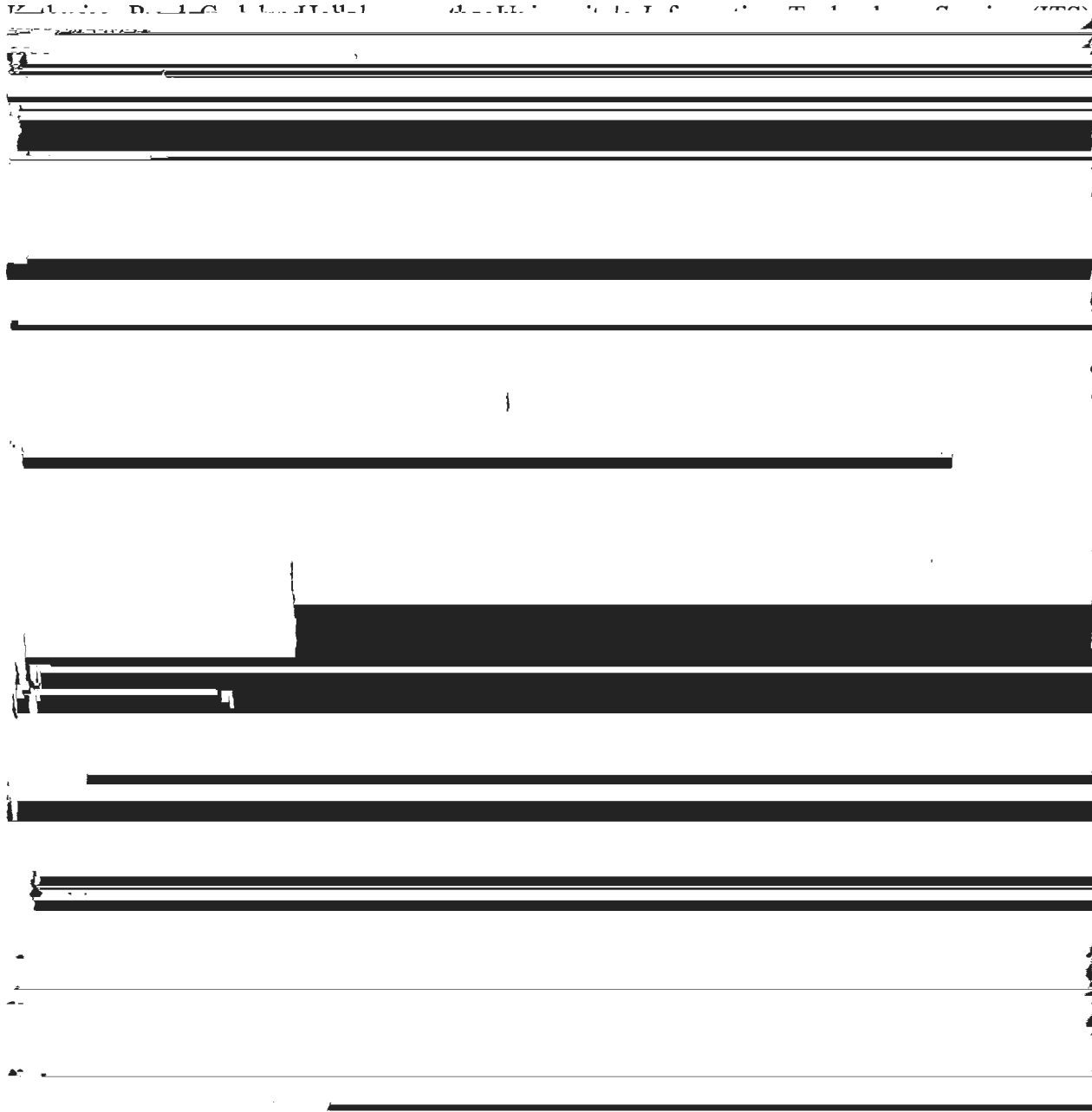
Junior

<u>Fall Term</u>	<u>Sem. Hrs.</u>	<u>Spring Term</u>	<u>Sem. Hrs.</u>
COSC 3090	3	COSC 4610	3
COSC 4800	3	BIOL upper division elective	3
BIOL 4101	3	BIOL lab course	3
CHEM 2111 or CHEM 2113	4	PHI 2310	2
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UCCS-Literature/Performing Arts	3	Elective	3
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	16		15

Senior

<u>Fall Term</u>	<u>Sem. Hrs.</u>	<u>Spring Term</u>	<u>Sem. Hrs.</u>
BIOL 4201	3	BIOL 4202	3
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	3		3
BIOL lab course	3	UCCS-Diverse Cultures	3
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UCCS – Theology	3	Electives	6

STUDENT COMPUTING FACILITIES



central computing facilities on the second floor, and MSCS department computing facilities on the first, third and fourth floors.

Marquette students, faculty and staff are granted accounts on the Fmarq 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 MSCS Department maintains its own independent computing facilities for both teaching and research purposes. Students enrolled in MSCS courses or as department majors are granted