2+2 BIOINFORMATICS FOUNDATIONS

Rochester Community and Technical College (RCTC) &
Winona State University (WSU)

The first two years provides the Associate in Science (A.S.) – Bioinformatics Foundations degree at RCTC; the second two years provides the Bachelor in Science (B.S.) in Applied Computer Science with the Bioinformatics track at WSU.

I. **GENERAL EDUCATION REQUIREMENTS.....43 Credits**

Courses must be selected from those approved to satisfy the competencies of the Minnesota Transfer Curriculum, (MNTC) Goals 1-10. Consult the RCTC catalog listings to determine which courses satisfy the areas listed below.

Goal 1: WRITTEN AND ORAL COMMUNICATION (CM).....11 CR

ENGL 1117*, 1118* Reading & Writing Critically I & II, 8 Cr
SPCH 1114, Fundamentals of Speech **OR** SPCH 1130, Interpersonal Communications, 3 cr

GOAL 2: CRITICAL THINKING (CT) MAY BE MET BY ANY COURSE IN MNTC 1-10 GOALS

Goal 3: NATURAL SCIENCES (NS).....12 CR

BIOL 1220 Concepts of Biology, 4 Cr
BIOL 2300 Genetics, 4 Cr
CHEM 1127 Chemical Principles I, 4 Cr

Goal 4: MATHEMATICS/LOGICAL REASONING (MA).....5 CR

MATH 1127 Calculus I, 5 Cr

Goal 5: HISTORY AND the SOCIAL AND BEHAVIORAL SCIENCES (SS).....6 CR

Choose courses from two different areas: Anthropology*, Economics*, Geography*, History*, JOUR 1110, Political Science, Psychology*, Sociology*

Goal 6: HUMANITIES – the ARTS, LITERATURE, and PHILOSOPHY (HA).....9 CR

Choose courses from two different areas: Art, Dance, English Literature, Foreign Culture, Humanities*, JOUR 1106, Music, PHIL 1125, Speech/Theatre.

***Honors equivalent available.**

II. **HEALTH AND HUMAN PERFORMANCE.....2 Credits**

Any combination of Health courses (numbered 1102, 1110, 1111, 1114, 1132, 1135, and 2126) and/or Physical Education Courses (numbered 1100-1199).
1 credit may be from Varsity Athletics, (PHED 1210 – 1236; 2210 – 2236)

III. **COMPUTER CORE REQUIREMENTS:.....11 Credits**

COMP 1150 Computer Science Concepts, 3 Cr
COMP 2243 Programming & Problem Solving, 4 Cr
COMP 2247 Algorithms and Data Structure, 4 Cr

Note: Students are encouraged to begin taking WSU computer science courses concurrently after completing the above core requirements.

IV. **PROFESSIONAL REQUIREMENTS:.....8 Credits**

CHEM 1128 Chemical Principles II, 4 Cr
MATH 2218 Discrete Mathematics, 4 Cr

TOTAL CREDITS.....64 Credits

Note: The award of the A.S. degree waives all WSU University Studies requirements except for the Flag requirements. (See WSU Catalog). Many of the required courses in the Bioinformatics Program include successful completion of prerequisites:
BIOL 1220-Prerequisite of high school Chemistry or CHEM 1101 or equivalent and high school Biology or BIOL 1101 or equivalent.
CHEM 1127 – Prerequisite of MATH 0099 or equivalent; MATH 1115, or concurrent enrollment strongly recommended. High school chemistry with a grade of C or better and/or CHEM 1101.

For more information contact:
http://www.rctc.edu/counseling_career_center/pdf/AdvisorList-2008-09.pdf

COMP 1150 – Prerequisite of MATH 0099 or placement score into MATH 1115; college level reading.
MATH 1127-Prerequisite of 4 years high school mathematics including trigonometric functions with a B average; college level reading.
MATH 2218-Prerequisite of MATH 1115 or equivalent; college level reading and writing.

MAJOR REQUIREMENTS AT WSU:

COMPUTER SCIENCE CORE.....20 Credits		
	CS 310 Social Implications of Computing	3 Cr
M	CS 341 Data Structures and Software Design	4 Cr
	CS 375 Computer Systems	4 Cr
W	CS 385 Applied Database Management Systems	3 Cr
W	CS 410 Software Engineering	3 Cr
O	CS 471 Object Oriented Design and Development	3 Cr
BIOINFORMATICS TRACK REQUIREMENTS.....9 Credits		
	CS 368 Introduction to Bioinformatics	3 Cr
	CS 468 Algorithms in Bioinformatics	3 Cr
	CS 485 Database System Design	3 Cr
BIOINFORMATCS TRACK CS ELECTIVES.....6 Credits		
	Choose **6 credits** from the following list of courses. At least 3 credits must be at the 400-level.	
	CS 313 Networking and Telecommunications	3 Cr
	CS 344 Introduction to Web Programming	3 Cr
	CS 369 Spatial Information Processing	3 Cr
	CS 405 Operating Systems	3 Cr
O	CS 411 Software Testing	3 Cr
	CS 415 Principles of Programming Languages	3 Cr
	CS 413 Advanced Networking & Telecommunications	3 Cr
	CS 420 Computer Architecture	3 Cr
	CS 425 Numerical Analysis	4 Cr
	CS 430 Computer Graphics	3 Cr
	CS 433 Digital Image Processing	3 Cr
	CS 435 Theory of Computation	3 Cr
	CS 444 Human Computer Interaction	3 Cr
	CS 445 Artificial Intelligence	3 Cr
	CS 450 Compilers	3 Cr
	CS 465 Topics: Computing Theory	1-3 Cr
	CS 466 Topics: General Computing Applications	1-3 Cr
	CS 476 Distributed System: Concept and Design	3 Cr
	CS 491* Practicum in Computer Science, 6 Cr (**Note:**Only 3 cr will count in major)	6 Cr
W	CS 495 Computer Science Research Seminar	3 Cr
	PHYS 333 Microprocessor Electronics	4 Cr
BIOINFORMATICS OPTION TRACK ELECTIVES.....3 Credits		
	One of the following courses **OR** any 400-level CS elective courses listed above:	
	CHEM 340 Survey of Organic Chemistry (WSU) or CHEM 2100 (RCTC)	4 Cr
	CHEM 350 Principles of Organic Chemistry I (WSU) or CHEM 2127 (RCTC)	4 Cr
	Any 400-level CS Electives course listed above	4 Cr
OTHER MAJOR REQUIREMENTS AT WSU .....7 Credits		
	STAT 303 Introduction to Engineering Statistics **OR**	3 Cr
	STAT 305 Biometry	3 Cr
	BIOL 242 Organismal Diversity (WSU) or BIOL 1230 (RCTC)	4 Cr
	Note: W, O and M = Flag Courses (See WSU Catalog).	
OPEN ELECTIVES.....19 Credits		
TOTAL CREDITS.....64 Credits		
REQUIRED FOR A BACHELOR OF SCIENCE (BS) BIOINFORMATICS.....128 Credits		

Implemented: Fall 2008; Revised: 10/08/2008; Reviewed: 03/2009

For more information contact:
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