

**HARFORD COMMUNITY COLLEGE – CHEMISTRY (Requiring non-calculus based Physics) A.S. DEGREE  
TOWSON UNIVERSITY/ Molecular Biology, Biochemistry and Bioinformatics (MB3) – BIOCHEMISTRY CONCENTRATION B.S. DEGREE**

HARFORD COMMUNITY COLLEGE			TOWSON UNIVERSITY			
COURSE #	COURSE TITLE	CRS.	TU EQUIVALENCY	CORE	COMMENTS	COURSE ID#
ENG 101	English Composition (GE) (Grade of C or better)	3	TSEM 102 WAIVED	1.	Towson Seminar	2348
MATH 109 or MATH 203 **	Pre-Calculus I (GM) or Calculus I (GM)	4	MATH 119 MATH 274	2. 3.	English Composition Mathematics	4381 4408
GH	Arts & Humanities (GH)	3	Depends on choice.	4.	Creativity & Creative Development	
GB	Behavioral/Social Science (GB)	3	Depends on choice.	5.		
CHEM 111	General Chemistry I (GL)	4	CHEM 131/131L	6.	Social & Behavioral Sciences	13097/13098
CHEM 112	General Chemistry II A (GL)	4	CHEM 132/132L	7. 8.	Biological & Physical Science Biological & Physical Science	13099/13100
GB*	Behavioral & Social Science (GB)	3	Depends on choice.	9.	Advanced Writing Seminar	
GH*	Arts & Humanities (GH)	3	Depends on choice.	10.	Metropolitan Perspectives	
				11.	The United States as a Nation	
				12.	Global Perspectives	
				13.	Diversity & Difference	
				14.	Ethical Issues & Perspectives	
<b>Total CORE In Transfer</b>		<b>27</b>				
MATH 203 OR PROG ELECT **	Calculus I (GM) or Program Elective	4	MATH 273 Depends on Choice.			4407
MATH 204 OR MATH216	Calculus II (GM) or Introduction to Statistics (GM)	4	MATH 274 MATH 231			4408 4393
PHYS 101	Introduction to Physics I (GL)	4	PHYS 211			6800
PHYS 102	Introduction to Physics II (GL)	4	PHYS 212			6801
CHEM 207	Organic Chemistry I	4	CHEM T31 (331)		Transfers as lower level credit.	10134
CHEM 208	Organic Chemistry II	4	CHEM T32 (332)		Transfers as lower level credit.	10135
BIO 120***	General Biology I (GL)	4	BIOL 200/200L			13759/13760
BIO 208***	Genetics	4	BIOL T09 (309)		Transfers as lower level credit	11379
PHYS ED ELECT	Physical Education Elective	1	PHEA TLL			10564
<b>Program Requirements at Harford</b>		<b>33</b>				
<b>Total Harford Program Requirements</b>		<b>60</b>				
<b>Maximum Credits in Transfer</b>		<b>64</b>				

**64 Credit Maximum.** 15 Core Curriculum units must be completed at Towson University; 4. Creativity; 9. Advanced Writing Seminar; 10. Metropolitan Perspectives; 12. Global Perspectives; 14. Ethical Issues

\*One GB or GH course must also satisfy Diversity requirement at HCC.

\*\*Students should complete Calculus at HCC. If MATH 109 (Pre-Calculus) is not needed, an additional program elective should be taken. CHEM 204 (Analytical Chemistry) is recommended. CHEM 204 transfers as CHEM 210 (Analytical Chemistry) to TU and will satisfy a required course for the Biochemistry concentration.

\*\*\*Students should choose BIO 120 and BIO 208 as program electives at HCC to satisfy required courses for the MB3 major at TU.

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**CORE REQUIREMENTS TO BE COMPLETED AT TOWSON      15 UNITS**

CORE 4:	Creativity and Creative Development	(3 UNITS)
CORE 9:	Advanced Writing Seminar	(3 UNITS)
CORE 10:	Metropolitan Studies	(3 UNITS)
CORE 12:	Global Perspectives	(3 UNITS)
CORE 14:	Ethical Issues and Perspectives	(3 UNITS)

**PROGRAM REQUIREMENTS TO BE COMPLETED AT TOWSON      33-46 UNITS**

**REQUIRED COURSES:      23-31 UNITS**

BIOL 409	MOLECULAR BIOLOGY	(4 UNITS)
CHEM 351	BIOCHEMISTRY I	(3 UNITS)
MATH 237	ELEMENTARY BIOSTATISTICS	(4 UNITS)
MBBB201	PROGRAMMING FOR BIOLOGISTS OR	(4 UNITS)
COSC 175	GEN COMPUTER SCIENCE	(4 UNITS)
MBBB 301	INTRO TO BIOINFORMATICS	(1 UNIT)
MBBB 493	SEMINAR IN BIOETHICS	(3 UNITS)
BIOL200 &	INTRODUCTION TO CELL BIOLOGY AND GENETICS	(1 UNIT)
BIOL 200L	INTRODUCTION TO CELL BIOLOGY AND GENETICS LAB	(4 UNITS)
	<i>(If BIOL 120 was not taken at HCC as a program elective)</i>	
BIOL 309	GENETICS	(3 UNITS)
	<i>(If BIOL 208 was not taken at HCC as a program elective)</i>	

**SELECT ONE OF THE FOLLOWING:      (3 UNITS)**

MBBB 495	CAPSTONE PROJECT*
BIOL 491	ELECTIVE IN INDEPENDENT RESEARCH*
CHEM 491	INTRODUCTION TO RESEARCH IN CHEMISTRY I*
COSC 495	INDEPENDENT STUDY*

**\*COURSES MAY BE REPEATED FOR A TOTAL OF 6 UNITS TOWARD THE MAJOR**

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**COURSES FOR BIOCHEMISTRY CONCENTRATION:** **10-15 UNITS**

CHEM 210 ANALYTICAL CHEMISTRY	(5 UNITS)
<i>(If CHEM 204 was not taken at HCC as a program elective)</i>	
CHEM 345 PRINCIPLES PHYSICAL CHEMISTRY	(3 UNITS)
CHEM 356 BIOCHEMISTRY LAB	(2 UNITS)
CHEM 357 BIOCHEMISTRY II OR	(3 UNITS)
BIOL/CHEM 450 ECOLOGICAL BIOCHEMISTRY	
CHEM 372 PHYSICAL CHEMISTRY LABORATORY	(2 UNITS)

**Additional Bachelor Degree Requirements**

- A C (2.0) or higher is required in all major and minor courses
- A cumulative grade point average (GPA) of 2.0 is required
- 32 units of the bachelor's degree must be completed at the upper level (courses numbered 300 or above)

<b><u>Total Credits to B.S. Degree</u></b>	<b><u>(120-121)</u></b>
Harford Biology A.S. Degree	60
Completion of Core at TU	15
Completion of Major Requirements at TU	33-46
Elective Credits at TU	0-12

