#### **Analytical/Instrumental Chemistry Major (BA/BS) Check List**

Note: This document is <u>not</u> legally binding: it is intended only to give guidance in planning one's program.

#### AN APPROVED MINOR (RECOMMENDED: PHYSICS OR PHYSICAL SCIENCE) IS REQUIRED FOR THIS MAJOR

#### CHEMISTRY UNITS REQUIRED (44 UNITS)

CHEM 102 Introductory Chemistry I 5 MATH 141 (C or better) or waiver thereof.  CHEM 104 Introductory Chemistry II 5 CHEM 102  CHEM 184 Introduction to Chemistry 1 3 CHEM 104  CHEM 251 Organic Chemistry I 3 CHEM 251  CHEM 261 Organic Chemistry Lab I 2 Co-requisite: CHEM 251  CHEM 260 Introduction to Inorgan Chem 4 Chem 104  CHEM 370 Physical Chemistry I 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 371 Physical Chemistry II 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 470 Physical Chemistry Lab I 1 CHEM 370 (co-requisite)  CHEM 454 Biochemistry I: Biochem of Macromolecules  CHEM 480 Instrumental Analysis 4 CHEM 252 and 352  CHEM 481 Instrumental Design and Maintenance	Course #	Course Title	Unit	Prerequisites
CHEM 104 Introductory Chemistry II 5 CHEM 102  CHEM 184 Introduction to Chemistry 1 3 CHEM 104  CHEM 251 Organic Chemistry II 3 CHEM 251  CHEM 252 Organic Chemistry II 3 CHEM 251  CHEM 261 Organic Chemistry Lab I 2 Co-requisite: CHEM 251  CHEM 360 Introduction to Inorgan Chem 4 Chem 104  CHEM 372 Quantitative Analysis 5 CHEM 104  CHEM 370 Physical Chemistry I 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 371 Physical Chemistry II 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 470 Physical Chemistry Lab I 1 CHEM 370 (co-requisite)  CHEM 454 Biochemistry I: Biochem of Macromolecules and CHEM 251  CHEM 480 Instrumental Analysis 4 CHEM 252 and 352  CHEM 481 Instrumental Design and 1 CHEM 480				•
CHEM 104 Introductory Chemistry II 5 CHEM 102  CHEM 184 Introduction to Chemistry 1 3 CHEM 104  CHEM 251 Organic Chemistry II 3 CHEM 251  CHEM 261 Organic Chemistry Lab I 2 Co-requisite: CHEM 251  CHEM 260 Introduction to Inorgan Chem 4 Chem 104  CHEM 352 Quantitative Analysis 5 CHEM 104  CHEM 370 Physical Chemistry I 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 371 Physical Chemistry II 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 470 Physical Chemistry Lab I 1 CHEM 370 (co-requisite)  CHEM 480 Instrumental Analysis 4 CHEM 252 and 352  CHEM 481 Instrumental Design and 1 CHEM 480	CHEM 102	Introductory Chemistry I	5	MATH 141 (C or better) or
CHEM 184 Introduction to Chemistry 1  CHEM 251 Organic Chemistry II 3 CHEM 251  CHEM 252 Organic Chemistry II 3 CHEM 251  CHEM 261 Organic Chemistry Lab I 2 Co-requisite: CHEM 251  CHEM 260 Introduction to Inorgan Chem 4 Chem 104  CHEM 352 Quantitative Analysis 5 CHEM 104  CHEM 370 Physical Chemistry I 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 371 Physical Chemistry II 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 470 Physical Chemistry Lab I 1 CHEM 370 (co-requisite)  CHEM 454 Biochemistry I: Biochem of Macromolecules 3 BIOL 120 or 141 (C or better) and CHEM 251  CHEM 480 Instrumental Analysis 4 CHEM 252 and 352  CHEM 481 Instrumental Design and 1 CHEM 480				waiver thereof.
CHEM 184 Introduction to Chemistry 1  CHEM 251 Organic Chemistry II 3 CHEM 251  CHEM 252 Organic Chemistry II 3 CHEM 251  CHEM 261 Organic Chemistry Lab I 2 Co-requisite: CHEM 251  CHEM 260 Introduction to Inorgan Chem 4 Chem 104  CHEM 352 Quantitative Analysis 5 CHEM 104  CHEM 370 Physical Chemistry I 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 371 Physical Chemistry II 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 470 Physical Chemistry Lab I 1 CHEM 370 (co-requisite)  CHEM 454 Biochemistry I: Biochem of Macromolecules 3 BIOL 120 or 141 (C or better) and CHEM 251  CHEM 480 Instrumental Analysis 4 CHEM 252 and 352  CHEM 481 Instrumental Design and 1 CHEM 480				
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CHEM 251 Organic Chemistry I 3 CHEM 104  CHEM 252 Organic Chemistry II 3 CHEM 251  CHEM 261 Organic Chemistry Lab I 2 Co-requisite: CHEM 251  CHEM 260 Introduction to Inorgan Chem 4 Chem 104  CHEM 352 Quantitative Analysis 5 CHEM 104  CHEM 370 Physical Chemistry I 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 371 Physical Chemistry II 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 470 Physical Chemistry Lab I 1 CHEM 370 (co-requisite)  CHEM 454 Biochemistry I: Biochem of Macromolecules 3 BIOL 120 or 141 (C or better) and CHEM 251  CHEM 480 Instrumental Analysis 4 CHEM 252 and 352  CHEM 481 Instrumental Design and 1 CHEM 480				
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CHEM 261 Organic Chemistry Lab I 2 Co-requisite: CHEM 251  CHEM 260 Introduction to Inorgan Chem 4 Chem 104  CHEM 352 Quantitative Analysis 5 CHEM 104  CHEM 370 Physical Chemistry I 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 371 Physical Chemistry II 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 470 Physical Chemistry Lab I 1 CHEM 370 (co-requisite)  CHEM 454 Biochemistry I: Biochem of Macromolecules 3 BIOL 120 or 141 (C or better) and CHEM 251  CHEM 480 Instrumental Analysis 4 CHEM 252 and 352  CHEM 481 Instrumental Design and 1 CHEM 480	CHEM 251	Organic Chemistry 1	3	CHEM 104
CHEM 261 Organic Chemistry Lab I 2 Co-requisite: CHEM 251  CHEM 260 Introduction to Inorgan Chem 4 Chem 104  CHEM 352 Quantitative Analysis 5 CHEM 104  CHEM 370 Physical Chemistry I 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 371 Physical Chemistry II 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 470 Physical Chemistry Lab I 1 CHEM 370 (co-requisite)  CHEM 454 Biochemistry I: Biochem of Macromolecules 3 BIOL 120 or 141 (C or better) and CHEM 251  CHEM 480 Instrumental Analysis 4 CHEM 252 and 352  CHEM 481 Instrumental Design and 1 CHEM 480	CHEM 252	Organic Chemistry II	3	CHEM 251
CHEM 260 Introduction to Inorgan Chem 4 Chem 104  CHEM 352 Quantitative Analysis 5 CHEM 104  CHEM 370 Physical Chemistry I 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 371 Physical Chemistry II 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 470 Physical Chemistry Lab I 1 CHEM 370 (co-requisite)  CHEM 454 Biochemistry I: Biochem of Macromolecules 3 BIOL 120 or 141 (C or better) and CHEM 251  CHEM 480 Instrumental Analysis 4 CHEM 252 and 352  CHEM 481 Instrumental Design and 1 CHEM 480	CITEM 232	Organic Chemistry II	J	CHEM 231
CHEM 260 Introduction to Inorgan Chem 4 Chem 104  CHEM 352 Quantitative Analysis 5 CHEM 104  CHEM 370 Physical Chemistry I 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 371 Physical Chemistry II 3 CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 470 Physical Chemistry Lab I 1 CHEM 370 (co-requisite)  CHEM 454 Biochemistry I: Biochem of Macromolecules 3 BIOL 120 or 141 (C or better) and CHEM 251  CHEM 480 Instrumental Analysis 4 CHEM 252 and 352  CHEM 481 Instrumental Design and 1 CHEM 480	CHEM 261	Organic Chemistry Lah I	2	Co-requisite: CHEM 251
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CHEM 371 Physical Chemistry II  CHEM 470 Physical Chemistry Lab I  CHEM 454 Biochemistry I: Biochem of Macromolecules  CHEM 480 Instrumental Analysis  CHEM 481 Instrumental Design and  MATH 254 and PHYS 141/181  CHEM 352; Co-requisites: MATH 254 and PHYS 141/181  CHEM 370 (co-requisite)  3 BIOL 120 or 141 (C or better) and CHEM 251  CHEM 480 Instrumental Analysis  4 CHEM 252 and 352				
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CHEM 454 Biochemistry I: Biochem of Macromolecules  CHEM 480 Instrumental Analysis  CHEM 481 Instrumental Design and  1 CHEM 480				MATH 254 and PHYS 141/181
CHEM 454 Biochemistry I: Biochem of Macromolecules  CHEM 480 Instrumental Analysis  CHEM 481 Instrumental Design and  1 CHEM 480	CHEM 470	Physical Chamistry Lab I	1	CHEM 270 (so requisite)
Biochem of Macromolecules and CHEM 251  CHEM 480 Instrumental Analysis 4 CHEM 252 and 352  CHEM 481 Instrumental Design and 1 CHEM 480	CHEM 4/0	Physical Chemistry Lab I	1	CHEM 370 (Co-requisite)
Biochem of Macromolecules and CHEM 251  CHEM 480 Instrumental Analysis 4 CHEM 252 and 352  CHEM 481 Instrumental Design and 1 CHEM 480	CHEM 454	Riochemistry I:	3	RIOL 120 or 141 (C or better)
CHEM 480 Instrumental Analysis 4 CHEM 252 and 352  CHEM 481 Instrumental Design and 1 CHEM 480	CITLIN TOT		ر	` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` `
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CHEM 481 Instrumental Design and 1 CHEM 480	CHEM 480	Instrumental Analysis	4	CHEM 252 and 352
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	CHEM 481	Instrumental Design and	1	CHEM 480
		Maintenance		

CHEM 484	Chemistry Seminar	1	Consent of Instructor

#### MATHEMATICS UNITS REQUIRED (UNIQUE REQUIREMENTS, 10 UNITS)

Course #	Course Title	<u>Units</u>	<u>Prerequisites</u>
MATH 253	Calculus and Analytic Geometry I	5	MATH 152
MATH 254	Calculus and Analytic Geometry II	5	MATH 253

### PHYSICS UNITS REQUIRED (UNIQUE REQUIREMENTS, 10 UNITS)

Course #	<b>Course Title</b>	<u>Units</u>	<u>Prerequisites</u>
PHYSICS 140	Principles of Physics I	5	Coreg. MATH 152
PHYSICS 141	Principles of Physics II	5	Physics 140
	OR		
PHYSICS 180	Physics for Scientists and	5	Coreg. MATH 253
	Engineers I		
PHYSICS 181	Physics for Scientists and	5	Physics 180
	Engineers II		or consent of instructor.
			Coreq: MATH 254

## PHYSICS UNITS REQUIRED (UNIQUE REQUIREMENTS, 2 UNITS)

Course #	Course Title	<u>Units</u>	Prerequisites
PHYSICS 221	Intermediate Laboratory	2	Physics 141 or 181 and
	-		MATH 254

### PHYSICS UNITS REQUIRED (UNIQUE REQUIREMENTS, 4 or 5 UNITS)

Course #	<b>Course Title</b>	Units	Prerequisites
PHYSICS 330	Analog and Digital Electronics	3	Physics 221 and MATH 361
PHYSICS 331	Analog and Digital Electronics Lab	1	Coreq. Physics 330
	OR		
PHYSICS 303	Microprocessor Lab	2	Physics 181 (or 141) and COMPSCI 171 or COMPSCI 172 or COMPSCI 174. Coreq. Physics 496 or consent of instructor
PHYSICS 496	Special Studies	3	Physics major or minor, Junior or Senior standing and consent of instructor

# PHYSICS UNITS REQUIRED (UNIQUE REQUIREMENTS, 2 or 4 UNITS)

Course #	Course Title	Units	Prerequisites
PHYSICS 360	Optics	2	Physics 324 or
			consent of instructor
	OR		
PHYSICS 344	Modern Physics	4	Physics 181 (or 141) and MATH 254