Dept. of Education and Allied Studies
John Carroll University – Teacher Education Program
Adolescent Young Adult Content Advisement form
Revised: 9.20.2011

Curriculum Content—Physical Science Dual Field Licensure
Chemistry Major/Physics Minor
84-87 Semester Hours Required

Praxis test – Chemistry: Content Knowledge (20245) or Physics: Content Knowledge (10265)

Course #	Course Title	Hours	Gr.	Sem.
CH 141/143[1]	General Chemistry I and Lab	5		Fall
CH 142/144	General Chemistry II and Lab	5		Spring
CH 221/223	Organic Chemistry I and Lab	4		Fall
CH 222/224	Organic Chemistry II and Lab	4		Spring
CH 261/263	Analytical Chemistry and Lab	4		Spring
CH 441/443	Instrumental Analysis and Lab	4		Fall
CH 478	Chemistry Seminar	0		Spring & Fall
CH 431	General Biochemistry	4		
PH 135/135L	Physics I and Lab	5		
PH 136/136L	Physics II and Lab	5		
PH 246	Modern Physics	3		
EP 217	Mathematical methods of Physics and Engineering	3		

Plus additional upper division courses in physics depending on chemistry electives (see footnotes 2)

BL 155/l56	Principles of Biology I and II	6		
BL 157/158	Principles of Biology Lab I and II	2		
MT 135	Calculus and Analytic Geometry I	4		
MT 136	Calculus and Analytic Geometry II	4		
MT 233	Calculus and Analytic Geometry III	4		

Select One:

CH 361	Introductory Physical Chemistry	3		Fall
CH 367[2]	Physical Chemistry Lab I	2		Spring & Fall
CH 365	Physical Chemistry I	3		Fall
CH 366	Physical Chemistry II	3		Every other Spring
CH 367	Physical Chemistry Lab I	2		Spring & Fall

Select One

PH 101/101L	Earth Science I and Lab	4		
PH 102/102L	Earth Science II and Lab	4		

NOTES ON CREDIT TOTALS:
MT=12; Earth=4; BL=8; CH=33-34 (4 or 7 depending on Physical Chemistry Sequence CH 361/367 or CH 365/6/7); PH=20 + 4 (where 4 additional credits come from double-dipping with the physical chemistry sequence CH 361/367 or CH 365/6/7).

[1]CH 151/153 may be substituted for CH 141/142/143/144 to save the student 5 credit hours
[2]CH 361/367 may be used to satisfy only one of the additional upper division physics courses with the approval of the physics department chairperson. An additional upper division physics course is therefore needed.

*Course meets Division V Core Requirement