UNDERGRADUATE AND PROFESSIONAL MAJOR CHANGE BULLETIN NO. 5
Fall 2019

--REQUIREMENTS--
Faculty Senate approved December 5, 2019

The requirements listed below reflect the undergraduate major curricular changes approved by the Catalog Subcommittee since approval of the last Undergraduate Major Change Bulletin. The text under the heading titled *Proposed* will show strikethroughs for deletions, and underlines for additions, as needed. Note: Items marked {S} have been streamlined and do not require Catalog Subcommittee review.

Dept	Proposed	Effective Date
Electrical Engineering and Computer Science Revise graduation requirements for Bachelor of Arts in Computer Science to meet accreditation requirements.	**Bachelor of Arts – Computer Science (120 Hours)** Students may certify in the Bachelor of Arts in Computer Science degree program in either the School of Electrical Engineering and Computer Science (Pullman), or in the School of Engineering and Applied Sciences (Tri-Cities). Certification requirements are the same on all campuses, but the application process may vary. Students should consult with an advisor at their campus of residence regarding readiness for certification, timing of application, and application. Students should also consult with an advisor regarding allowed course substitutions vis-à-vis the schedule of studies listed below. Students may apply for certification into the Bachelor of Arts in Computer Science degree program after completion of the following courses with a grade of C or better and a cumulative GPA of 2.5 or higher: CPT S 121, 122, and 223, or CPT S 131, 132, and 233; MATH ~~201, 202,~~ <u>171, 172,</u> 216. ~~The MATH 171, 172 sequence may be substituted for the MATH 201, 202 sequence.~~ Certification in more than one of the following majors is not allowed: BA Computer Science, BS Computer Science, BS Software Engineering. (See academic coordinator for details.) **Certification Guarantee:** Students who have completed the courses noted above with an average GPA of at least 3.2, who have an overall GPA of at least 3.2 in the completed courses required in the major, and who have not repeated any required courses, are guaranteed certification. No courses listed in this schedule of study may be taken on a pass/fail basis. With the exception of CPT S 488, 489, and ENGR 489 all listed E E and CPT S courses, required electives, and prerequisites to these courses must be completed with a grade of C or better. In addition to the outlined requirements, all students are expected to meet the university certification requirements—see Academic Regulation 53 in the catalog. Consult with advisor at campus of residence for alternative course sequences.	1-20

	First Year	
	First Term	*Hours*
	Arts [ARTS]	3
	CPT S 121 or 131[1]	4
	HISTORY 105 [ROOT]	3
	<u>MATH 171</u>	<u>4</u>
	~~MATH 201[2]~~	~~3~~
	PHIL 201 [QUAN]	3
	Second Term	*Hours*
	CPT S 122 or 132[1]	4
	ENGLISH 101 [WRTG]	3
	<u>MATH 172</u>	<u>4</u>
	~~MATH 202[2]~~	~~3~~
	MATH 216	3
	Social Sciences [SSCI]	3
	Second Year	
	First Term	*Hours*
	CPT S 223 or 233[1]	3
	CPT S 260	3
	Diversity [DIVR]	3
	Minor Elective[~~3~~2]	3
	STAT 212 <u>or 360</u>	<u>3 or 4</u>
	Second Term	*Hours*
	Biological Sciences [BSCI] with lab[~~4~~3]	4
	CPT S 355	3
	~~MATH Elective[2]~~	~~3~~
	<u>MATH 220</u>	<u>2</u>
	Physical Sciences [PSCI] with lab[~~4~~3]	4
	Complete Writing Portfolio	
	Third Year	
	First Term	*Hours*
	CPT S 322 [M]	3
	ENGLISH 402 [WRTG] [M]	3
	Minor Electives (choose two)[~~3~~2]	<u>5 or 6</u>
	Science Elective (with lab)[~~4~~3]	4
	Second Term	*Hours*
	300-400-level Minor Elective[~~3~~2]	3
	~~Advanced CPT S Electives (choose two)[5]~~	~~6~~
	CPT S 302	3
	<u>CPT S 317</u>	<u>3</u>

	CPT S 360 or 370[1]	4
	Science Elective[4][3]	3

Fourth Year

First Term	*Hours*
300-400-level Minor Elective[3][2]	3
~~Advanced CPT S Electives (choose two)[5]~~	~~6~~
CPT S 350	3
CPT S 421[6][4]	3
CPT S 427	3
Humanities [HUM]	3

Second Term	*Hours*
300-400-level Minor Elective[3][2]	3
Advanced CPT S Electives (choose two)[5]	6
CPT S 423 [CAPS][6][4]	3
Complete CPT S Exit Interview and Survey	

Footnotes

[1] Students may choose between a C/C++ (CPT S 121, 122, 223, 360) path or a Java programming (CPT S 131,132, 233, 370) path. Students should stick to one path option. The Java track is not available in Tri Cities.

[2] ~~Either math sequence below will satisfy the math requirement for this degree. Sequence B will allow a broader selection of advanced computer science electives. The course work in mathematics must total at least fifteen semester hours (including MATH 216). Sequence A: MATH 201, 202, STAT 212, and a MATH elective chosen from the following list: MATH 364, 416, or STAT 412. Sequence B: MATH 171, 172, 220, and STAT 212 or STAT 360.~~

[2][3] Elective credits may include a minor program. Completion of a minor is strongly encouraged. ~~If a minor in a science or engineering discipline is contemplated, Math Sequence B should be taken (see note 2).~~

[3][4] Science electives: A minimum of 15 credits required. Must include a year-long sequence (two semesters including a laboratory in each semester) of [BSCI], [PSCI], or [SCI] and two additional science courses, one of which must have a laboratory component. Electives include BIOLOGY 106, 107; CHEM 101, 102 or 105, 106; PHYSICS 101, 102 or 201, 202.

[4] Consult with an advisor at campus of residence for allowed substitutions

[5] Advanced CPT S Electives: ~~18~~ 6 credits required. ~~At least 12 credit must be in CPT S courses and include a minimum of 6 credits of~~ These credits must be in 300- or 400- or 500-level CPT S courses~~,~~ and they must include at least one of the following courses: CPT S 315, 415, 451, 471, or 475. ~~The remaining 6 credits may be at the 300-, 400-, or 500-level in CPT S (preferred), MATH, STAT, E E, PHYSICS or another department with the approval of the EECS advisor. Students certified at Tri-Cities must include two courses from CPT 427, 440, 442, 460, 471, and 481.~~ A maximum of 3 credits ~~each~~ from CPT S 490 and 499, or 3 credits ~~each~~ from CPT S 488 ~~and~~or 499 may be selected as CPT S electives. Consult with advisor at campus of residence for course choices.

[6] ~~Consult with an advisor at campus of residence for allowed substitutions.~~

| Electrical Engineering and Computer Science

Revise graduation requirements for Bachelor of Science in Computer Science to meet accreditation requirements. | **Bachelor of Science – Computer Science (120 Hours)**

Students may certify in the Bachelor of Science in Computer Science degree program in either the School of Electrical Engineering and Computer Science (Pullman), or in the School of Engineering and Applied Sciences (Tri-Cities). Certification requirements are the same on both campuses but the application process may vary. | 1-20 |

Students should consult with an advisor at their campus of residence regarding readiness for certification, timing of application, and application. Students should also consult with an advisor regarding allowed substitutions vis-à-vis the schedule of studies listed below.

Students may apply for certification into the Bachelor of Science in Computer Science degree program after completion of the following courses with a grade of C or better and a cumulative GPA of 2.5 or higher: CPT S 121 and 122, or 131 and 132, MATH 171, 172, 216, and PHYSICS 201. Certification in more than one of the following majors is not allowed: BA Computer Science, BS Computer Science, BS Software Engineering. (See academic coordinator for details.)

Certification Guarantee: Students who have completed the courses noted above with an average GPA of at least 3.2, who have an overall GPA of at least 3.2 in the completed courses required in the major, and who have not repeated any required courses, are guaranteed certification.

No courses listed in this schedule of study may be taken on a pass/fail basis. With the exception of CPT S 488, 490, 499, and ENGR 489, all listed E E and CPT S courses, required electives, and prerequisites to these courses must be completed with a grade of C or better. In addition to the outlined requirements, all students are expected to meet the university certification requirements—see Academic Regulation 53 in the catalog. Consult with advisor at campus of residence for alternative course sequences.

First Year

First Term	Hours
CPT S 121 or 131[1]	4
ENGLISH 101 [WRTG]	3
MATH 171 [QUAN]	4
PHIL 201	3

Second Term	Hours
CPT S 122 or 132[1]	4
HISTORY 105 [ROOT]	3
MATH 172	4
MATH 216	3

Second Year

First Term	Hours
CPT S 223 or 233[1]	3
CPT S 260	3
MATH 220	2
MATH 273 or 301	2 or 3
PHYSICS 201 [PSCI]	4

Second Term	Hours
CPT S 317	3

CPT S 322 [M]		3
CPT S 355		3
PHYSICS 202		4
CPT S Technical Elective[2]		3
Complete Writing Portfolio		

Third Year

First Term	*Hours*
CPT S 302	3
CPT S 350	3
CPT S 360 or 370[1]	4
ENGLISH 402 [WRTG] [M]	3
CPT S Technical Elective [2]	3

Second Term	*Hours*
Diversity [DIVR]	3
CPT S 427	3
STAT 360	3
Computer Science ~~CPT S Free~~ Electives[3]	6
~~CPT S Technical Elective[2]~~	~~3~~

Fourth Year

First Term	*Hours*
Arts [ARTS]	3
CPT S 421	3
Social Sciences [SSCI][4]	3
CPT S Technical Electives[2]	6

Second Term	*Hours*
Biological Sciences with Lab [BSCI]	4
CPT S 423 [CAPS]	3
Humanities [HUM]	3
Computer Science ~~CPT S Free~~ Electives[3]	6
Complete CPT S Exit Interview and Survey	

Footnotes

[1] Students may choose between a C/C++ (CPT S 121, 122, 223, 360) path or a Java programming (CPT S 131, 132, 233, 370) path. Students should remain in one path option. The Java track is not available in Tri-Cities.

[2] CPT S Technical Electives consist of ~~five~~ four courses (~~15~~ 12 credits) taken from the courses listed below, with at least one course from ~~each of the following three areas:~~ the Software area and one course from the Data and Information Management area. CPT S 483 (Topics in Computer Science) may also be considered as a CPT S Technical Elective with departmental approval. Consult your academic advisor. Systems: CPT S 411, ~~427,~~ 442, 455, 460, 464, 466; Data and Information Management: CPT S 315, 415, 451, 471, 475; Software: CPT S 321, 323, 422, 443, 479, 481, 484, 487, 489; ~~Data and~~ Artificial Intelligence ~~(AI)~~ and Machine Learning: CPT S ~~315, 415,~~ 434, 437, 440, ~~451, 471, 475;~~ Scientific and Visual Computing: CPT S 430, 442, 453.

[3] ~~Free~~ Computer Science Electives: Four additional courses (12 credits) at the 300-400-level that are not used as Technical Electives. At least 6 credits must be CPT S courses. Approved non-

CPT S courses are: 300-400-level E E courses, CE 463, DTC 335, E M 464, MATH 315, 401, 420, 421, MBIOS 478, MSE 302, PHYSICS 303, 443, and STAT 436. Additional ~~Free~~ Electives may include a maximum of 3 credits each of CPT S 490 and 499, or 3 credits each of CPT S 488, 499, and ENGR 489.

[4] ECONS 101 or 102 recommended.

Electrical Engineering and Computer Science Revise graduation requirements for Bachelor of Science in Software Engineering to meet accreditation requirements.	**Software Engineering (121 Hours)**	**1-20**

Software Engineering (121 Hours)

Students may apply for certification into the Bachelor of Science in Software Engineering degree program after completion of the following courses with a grade of C or better and a cumulative GPA of 2.5 or higher: CPT S 121 or 131, 122 or 132, MATH 171, 172, and PHYSICS 201 or CHEM 105.

Certification in more than one of the following majors is not allowed: BA Computer Science, BS Computer Science, BS Software Engineering. (See academic coordinator for details.)

Certification Guarantee: Students who have completed the certification courses noted above with an average GPA of at least 3.2, who have an overall GPA of at least 3.2 in the completed courses required in the major, and who have not repeated any required courses, are guaranteed certification.

No courses listed in this schedule of study may be taken on a pass/fail basis. All listed E E and CPT S courses, required electives, and prerequisites to these courses must be completed with a grade of C or better.

First Year

First Term	*Hours*
CPT S 121 or CPT S 131[1]	4
ENGLISH 101 [WRTG] or ENGLISH 105 [WRTG]	3
MATH 171 [QUAN]	4
Math Requirement[2]	3

Second Term	*Hours*
CPT S 122 or CPT S 132[1]	4
HISTORY 105 [ROOT]	3
MATH 172	4
MATH 216	3

Second Year

First Term	*Hours*
CPT S 223 or CPT S 233[1]	3
CPT S 260	3
MATH 220	2
Math Requirement[2]	2 or 3

PHYSICS 201 [PSCI] or CHEM 105 [PSCI]	4	
Second Term	***Hours***	
Arts [ARTS]	3	
CPT S 321	3	
CPT S 355	3	
ECONS 101 [SSCI] or ECONS 102 [SSCI]	3	
Humanities [HUM]	3	
Complete Writing Portfolio		
Third Year		
First Term	***Hours***	
CPT S 302	3	
CPT S 317	3	
CPT S 322 [M]	3	
CPT S 360 or CPT S 370[1]	4	
ENGLISH 402 [WRTG] or ENGLISH 403 [WRTG]	3	
Second Term	***Hours***	
Biological Science [BSCI]	3	
CPT S 350	3	
CPT S 487	3	
Diversity [DIVR]	3	
MATH/CPT S 453 or STAT 419	3	
STAT 360	3	
Fourth Year		
First Term	***Hours***	
CPT S 421	3	
CPT S 422 [M]	3	
CPTS S 427	3	
~~CPT S 451 or CPT S 455~~	~~3~~	
CPT S 484	3	
Software Engineering Option Course[3]	3	
Second Term	*Hours*	
CPT S 423 [CAPS]	3	
~~CPT S 460, CPT S 464, or CPT S 466[4]~~	~~3~~	
CPT S 476	3	
Data and Information Management Elective[4]	3	
Software Engineering Option Courses[3]	6	
Complete CPT E Exit Interview and Survey		

	Footnotes	
	[1] Students may choose between a C/C++ (CPT S 121, 122, 223, 360) path or a Java programming (CPT S 131, 132, 233, 370) path. Students should remain in one path option. The Java track is not available in Tri-Cities.	
	[2] Math Requirement: minimum 5 credits from the following: MATH 273, MATH 301, PHIL 201, STAT 212.	
	[3] Software Engineering Option Courses (~~Nine~~ 9 credits required): Any 400 level course in CPT S, E E, or MATH not used to fulfill major requirements. Upper-division courses in other disciplines may be used with prior approval by advisor.	
	[4] ~~Three credits of CPT S 483 may be substituted with prior approval by advisor.~~ Data and Information Management Elective (3 credits required): Choose at least one from CPT S 315, 415, 451, 471, 475.	
Languages, Cultures, and Race Add new Minor in Global and Ethnic Narrative Traditions	**Minor in Global and Ethnic Narrative Traditions** A systematic approach to the study of a variety of regional myths, and global, ethnic, and racial narrative traditions in their original context as well as in more contemporary reinterpretations through literature and film and other cultural arenas, with the aim to challenge and resituate dominant views about race and ethnicity, gender, social classes, and different political practices. When we consider how contemporary writers, filmmakers, poets, playwrights, painters, music composers, and other cultural producers use the forms and elements of these storytelling practices we can more effectively analyze how these narratives have the power to articulate political ideas as well as social and cultural transformations. In this manner, the program develops our students' critical thinking and encourages them to re-interpret the place of the self as an identity culturally situated. Narratives to be studied address specific topics related to gender (representations of women, men, homosexuality, etc.), age (representations of childhood, youth, the elderly, etc.), history (representations of war, revolutions, dictatorships, democratization, etc.), culture and society (gendered roles, race, nature, religion, social classes, immigration, etc.), to mention a few. Completion of the minor requires 18 semester credits including a required core (6 credits) and 12 credits of electives. At least 9 credits of approved coursework must be taken at the 300-400 level, and no courses taken Pass/Fail will count towards the 18-credit requirement. **Required courses (6 credits):** Two course from CES/ENGLISH 220 <u>or</u> FOR LANG 130; FOR LANG 110 <u>or</u> 410; FOR LANG 120.	**8-20**

	Elective courses (12 credits): Four courses from three categories below. **Category 1 - Literature and Mythology** 2 courses from: ASIA/CHINESE/JAPANESE 131; CES 313/ENGLISH 311; CES/ENGLISH 314; CES 331/ENGLISH 321; CES 332/ENGLISH 322; CES 353/ENGLISH 345; CES 373/ENGLISH 341; FOR LANG 370, 371, 373; one from FRENCH 350 or 430; one from GERMAN 350, 450, 451, or 452; one from SPANISH 350, 351, 430, 450, 451 or 452. **Category 2 - Culture and Film** one course from: ASIA/CHINESE/JAPANESE 111; ASIA/CHINESE 330; ASIA/JAPANESE 122, 123; CES 254; CHINESE 120, 121, 311; FRENCH 110, 120, 310, 320, 410, 420; GERMAN 110, 120, 310, 320; SPANISH 110, 111, 120, 121, 310, 311, 320, 321, 420. **Category 3 - History and Society** one course from CES 111, 131, 151, 171, 255; CES 211/HISTORY 201; CES/HISTORY 235. 15 of the credits must be taken at WSU. A grade of C or better must be earned in each of the courses applied to the minor. No course may be repeated for credit. No more than 6 credits may apply toward completion of a different minor. Other courses may be added to the list of acceptable electives. To discuss any course equivalencies, please contact the minor coordinator.	
Physics & Astronomy Revise description for Rule 53 changes and revise graduation requirements for Bachelor of Science in Physics - Standard Option in conjunction with approved increase in credits for PHYSICS 410.	**Physics - Standard Option (12~~1~~0 Hours)** The program of courses below is appropriate for students who have had a good experience with calculus in high school and wish to start physics in the first semester at WSU (even though the student may be placed in MATH 171, if their high school grades for the year course were B or better they can follow this schedule of study). Students who have placed in MATH 172 can accelerate the math sequence. Students who have not had calculus in high school should defer PHYSICS 201 until they have completed MATH 171. Upon consultation with the departmental advisor, modifications can be made in the list of required courses to fit the needs of individual students. The schedule of studies below includes the	**8-20**

additional lab credit required for graduation by the College of Arts and Sciences.

Certification Requirements

~~A student may certify as a physics major after completing 30 credits (preferably including PHYSICS 201 and MATH 171) with a cumulative GPA of 2.0 or better.~~

<u>Students may be admitted to the physics major upon making their intentions known to the department.</u>

Graduation Requirements

A research experience is required of all students as a PHYSICS 499 project; however, to gain valuable work experience outside the university, students are strongly encouraged to participate in an internship or research experience in industry or a government lab outside of WSU. The summer after the junior year is the most appropriate time for this experience. All students are required to submit an undergraduate thesis to a committee of two physics faculty members in the senior year. PHYSICS 490 will give credit for this effort. The student must earn a C (2.0) or better grade in each of the required physics courses.

Third Year

First Term	*Hours*
CPT S 121, E E 221, or MATH 300	2-4
Diversity [DIVR]	3
Humanities [HUM]	3
MATH Elective[2]	3
PHYSICS 320	3
PHYSICS 341	3
Second Term	*Hours*
COM 400 [COMM], ENGLISH 301 [WRTG], or ENGLISH 402 [WRTG]	3
MATH Elective[2]	3
PHYSICS 342	3
PHYSICS 410	~~3~~ 4
PHYSICS 499	1
Standard Option Elective [3]	3

Fourth Year

First Term	*Hours*

	Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI] 3	
	PHYSICS 450 3	
	PHYSICS 490 [M] 1	
	Standard Option Electives[3] 6	
	Technical Elective[4] 3	
	Second Term ***Hours***	
	Integrative Capstone [CAPS] 3	
	PHYSICS 415 [M] 3	
	Standard Option Electives[3] <u>4 - 6</u>	
	Technical Elective[4] 3	
	Footnotes [3] Standard Option Electives (~~15~~ <u>13</u> credits): Choose from 300-400-level ASTRONOM and PHYSICS courses not used to fulfill other requirements.	
Physics & Astronomy Revise description for Rule 53 changes and revise graduation requirements for Bachelor of Science in Physics - Astrophysics Option in conjunction with the approved increase in credits for PHYSICS 410.	**Physics - Astrophysics Option (120 Hours)** The program of courses below is appropriate for students who have had a good experience with calculus in high school and wish to start physics in the first semester at WSU (even though the student may be placed in MATH 171, if their high school grades for the year course were B or better they can follow this schedule of study). Students who have placed in MATH 172 can accelerate the math sequence. Students who have not had calculus in high school should defer PHYSICS 201 until they have completed MATH 171. Upon consultation with the departmental advisor, modifications can be made in the list of required courses to fit the needs of individual students. The schedule of studies below includes the additional lab credit required for graduation by the College of Arts and Sciences. **~~Certification Requirements~~** ~~A student may certify as a Physics major after completing 30 credits (preferably including PHYSICS 201 and MATH 171) with a cumulative GPA of 2.0 or better.~~ <u>Students may be admitted to the physics major upon making their intentions known to the department.</u> **Graduation Requirements** A research experience is required of all students as a PHYSICS 499 project; however, to gain valuable work experience outside the	**8-20**

university, students are strongly encouraged to participate in an internship or research experience in industry or a government lab outside of WSU. The summer after the junior year is the most appropriate time for this experience. All students are required to submit an undergraduate thesis to a committee of two physics faculty members in the senior year. PHYSICS 490 will give credit for this effort. The student must earn a C (2.0) or better grade in each of the required physics courses.

Third Year

First Term	*Hours*
ASTRONOM 345	3
CPT S 121, E E 221, or MATH 300 [M]	2-4
Humanities [HUM]	3
MATH Elective[1]	3
PHYSICS 320	3
PHYSICS 341	3

Second Term	*Hours*
ASTRONOM 435 or 436	3
COM 400 [COMM], ENGLISH 301 [WRTG], or ENGLISH 402 [WRTG]	3
MATH Elective[1]	3
PHYSICS 342	3
PHYSICS 410	~~3~~ 4
PHYSICS 499	1

Fourth Year

First Term	*Hours*
Arts [ARTS], Humanities [HUM], or Social Sciences [SSCI]	3
Diversity [DIVR]	3
PHYSICS 450	3
PHYSICS 490 [M]	1
Technical Elective[2]	~~3~~ 4

Second Term	*Hours*
ASTRONOM 435 or 436	3
Integrative Capstone [CAPS]	3
PHYSICS 415 [M]	3
Technical Elective[2]	6

Footnotes

[2] Technical Electives (~~10~~ 9 credits, at least 6 must be 300-400 level): Choose from ASTRONOM, CHEM, MATH, or PHYSICS courses not used to fulfill other requirements.