

Approval Chart for Curriculum ChangesA = Approve I = Information Item¹ R = Advise & Respond²Course Number PHYS 220 or Degree Plan(s) _____

State the requested change and reason. A memo may be attached if more space is necessary.

Change Prerequisite:Current: Calculus or concurrent enrollment in MATH 185.Change to: Math 185

See Attached

Circle the number that corresponds to the requested change. Degree plan changes are on the second page.

		COUNCIL ³								
	Change to a Course	Dept./School	College Academic	Deans	TEC	UGEC	UUAC	GRAD	Provost	President
1.	Title (description unchanged)	A	A	A		I			I	I
2.	Description (not affecting content)	A	A	A		I			I	I
3.	Content (substantive change)	A	A	A		I			A	A
4.	Number of hours (lecture, lab, contact)	A	A	A		A			A	A
5.	Course number within the hundred	A	A	I		I			I	I
6.	Course number beyond the hundred	A	A	A		A			A	A
7.	Prerequisites	A	A	A		I			I	I
8.	Course fee(s)	A	--	A		--			A	I
9.	From U to G <i>or</i> G to U	A	A	A		A			A	A
10.	Cross list with another department: U or G level	A	A	A		A			A	A
11.	Department of record	A	A	A		A			A	A
12.	Open or close a course	A	A	A		A			A	A
13.	New course — See website for application and process. This change includes combining or splitting a course(s).	A	A	A		A			A	A

Note: When an academic unit does not have a council, the UGEC and/or UUAC will serve as its academic council, depending on the nature of the issue.

Approval Chart for Curriculum Changes

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		COUNCIL ³							Board of Trustees			
	Change to a Degree Plan	Dept./School	College Academic	Deans	TEC	UGEC	UUAC	GRAD		Provost	Faculty	President
1.	University Requirements — Change in approved course content ⁶	A	A	A	A				A	--	A	--
2.	University Requirements — Add or drop a required course from the University Requirements chart ⁶	A	A	A	A				A	A	A	--
3.	University Requirements — Add or drop a course from a menu within the University Requirements ⁶	A	--	--	A				A	--	A	--
4.	University Requirements — Change hours within a menu on the University Requirements chart ⁶	A	A	A	A				A	A	A	--
5.	Major — Revision of major ^{4,5}	A	A	A	A				A	--	A	--
6.	Major — Adopt or change admission requirements	A	A	A	A				A	--	A	--
7.	Major — Add ^{4,5}	A	A	A	A				A	A	A	I
8.	Major – Discontinue (proposed by the department or college)	A	A	A	A				A	A	A	I
9.	Major – Discontinue (proposed by the Provost)	See below.										
10.	GPA — Revise major or cumulative requirement	A	A	A	A				A	A	A	--
11.	Minor — Revise course selection	A	A	A	I				I	--	I	--
12.	Minor — Add	A	A	A	A				A	--	A	--
13.	Minor – Discontinue (proposed by the department or college)	A	A	A	A				A	--	A	--
14.	Minor – Discontinue (proposed by the Provost)	See below.										
15.	Degree — Add	A	A	A	A				A	A	A	I
16.	Degree – Discontinue (proposed by the department or college)	A	A	A	A				A	A	A	I
17.	Degree – Discontinue (proposed by the Provost)	See below.										
18.	Any change to a graduate degree program	A	A	A	A				A	--	A	--

		COUNCIL ³							Board of Trustees
	Provost-Proposed Change	Provost	Department	Dean	TEC	UUAC	Graduate	Faculty	
1.	Major/Graduate Program — Discontinue (proposed by the Provost)	A	R	R		A		A	I
2.	Minor — Discontinue (proposed by the Provost)	A	R	R		A		--	--
3.	Degree — Discontinue (proposed by the Provost)	A	R	R		A		A	I

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COUNCIL ³									
	Change to the Catalog Information	Dept./School	College Academic	Deans	UGEC	UUAC	GRAD	Provost	President
1.	General requirements for graduation including course requirements that are common to all majors for all degrees ⁷	--	--	--		A		A	A
2.	Admission requirements	--	--	--		A		A	A
3.	Policies governing academic probation and suspension	--	--	--		A		A	A
4.	Requirements for graduating with honors	--	--	--		A		A	A
5.	Other academic policy changes	--	--	--		A		A	A

¹ Councils may request additional information about “Information” items. These items are approved as “Consent Agenda.”

² The Dean and Department should respond to the Provost’s recommendation to close a program in writing. Advise & Respond (R) requires that the voting body should receive the written responses at least one week prior to the vote.

³ All courses that meet University Requirements for general education must go through UGEC. Courses or degrees offered only to students seeking teacher certification must go through the Teacher Education Council. All undergraduate changes must go before the UUAC. All graduate degree plan changes must go through the Graduate Council.

⁴ A minimum of 30 hours is required for a major. A maximum is specified for each degree (e.g., BA, BS). The university minimum for elective hours is 6, unless the requirements of external accrediting bodies make it impossible.

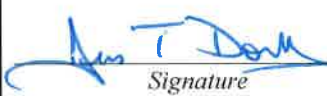
⁵ Program or course changes that apply to any major that includes Teacher Certification will be reviewed by the college, the Teacher Education Council (TEC), and then the UUAC.

⁶ Courses that satisfy ACU’s University Requirements (General Education) will normally have lower-level numbering, be free of prerequisites and co-requisites, appeal to more than one or two majors, and “not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession” (SACS 2.7.3). Departments may request exceptions to the first three criteria.

⁷ The UUAC approved the clarification that “general requirements for graduation” means the enumerated items in the “General Requirements for Bachelor’s Degrees” section of the catalog.

Revised 1-29-16

Curriculum/Catalog Changes Signature Page

Department/School Chair(s)	
 Signature	8/22/16 Approval date
_____ Signature	_____ Approval date

College Academic Council(s)	
 Signature	9.16.16 Approval date
_____ Signature	_____ Approval date

Dean(s)	
 Signature	9/22/16 Approval date
_____ Signature	_____ Approval date

Teacher Education Council	
_____ Chair's signature	_____ Approval date

General Education Council	
_____ Chair's signature	_____ Approval date

Undergraduate Academic Council	
_____ Chair's signature	_____ Approval date

Graduate Council	
_____ Chair's signature	_____ Approval date

Provost	
_____ Signature	_____ Approval date

Faculty	
_____ Chair of faculty senate	_____ Approval date

President	
_____ Signature	_____ Approval date

enrollment in PHYS 113 is highly suggested. Prerequisite: PHYS 110. May be used to satisfy University Requirements.

PHYS 113 General Physics II Laboratory (0-2-1), spring, summer. May be used to satisfy University Requirements.

PHYS 135 Introduction to Electric Circuits (3-0-3), spring. Basic electrical measurements and devices, introductory electronics. Emphasis on lab work. Intended for those who will use electronic instruments and methods in their profession. Concurrent enrollment in PHYS 136 is required. Prerequisite: Passing MATH 124 or testing into MATH 185 or higher on the Math placement exam. Same as ENGR 135.

PHYS 136 Introduction to Electric Circuits Laboratory (0-3-1), spring. Concurrent enrollment in PHYS 135. Same as ENGR 136.

PHYS 203 Physical Science for Teachers (3-0-3), fall, spring, summer. A science course of primary interest to pre-service teachers. The course uses inquiry-based and other "best-practice techniques" to apply physical science concepts to situations within the world and at the same time applicable to the future teacher's classroom. May be used to satisfy University Requirements.

PHYS 220 Engineering Physics I (3-0-3), spring, and as needed. Mechanics of particles, rigid bodies, fluids, and wave motion. Concurrent enrollment in PHYS 221 is required. Prerequisite: Calculus or concurrent enrollment in MATH 185. May be used to satisfy University Requirements.

PHYS 221 Engineering Physics I Laboratory (0-3-1), spring, and as needed. Concurrent enrollment in PHYS 220. May be used to satisfy University Requirements.

PHYS 222 Engineering Physics II (3-0-3), fall, and as needed. Heat, thermodynamics, electricity, and magnetism. Concurrent enrollment in PHYS 223. Prerequisite: PHYS 220/221. May be used to satisfy University Requirements.

PHYS 223 Engineering Physics II Laboratory (0-3-1), fall, and as needed. Concurrent enrollment in PHYS 222. May be used to satisfy University Requirements.

PHYS 330 Modern Physics (3-0-3), spring, and as needed. Special relativity, invariance principles, foundations of quantum mechanics, atomic spectra, molecular physics, nuclear physics, and elementary particles. Laboratory emphasizes atomic and nuclear physics. Concurrent enrollment in PHYS 331. Prerequisite: PHYS 222/223. May be used to satisfy University Requirements.

PHYS 331 Modern Physics Laboratory (0-3-1), spring, and as needed. Concurrent enrollment in PHYS 330. May be used to satisfy University Requirements.

PHYS 342 Measurement Techniques (2-0-2), fall. An introduction to transducers for measuring physical phenomena such as temperature, pressure, and acceleration. Signal processing and statistical concepts related to measured variables are also included. Prerequisites: PHYS 222, MATH 361. Concurrent enrollment in PHYS 343 required.

PHYS 343 Measurement Techniques Laboratory (0-3-1), fall. A laboratory introduction to transducers for measuring physical phenomena such as temperature, pressure, and acceleration. Signal processing and statistical concepts related to measured variables are also included. Prerequisites: PHYS 222, MATH 361. Concurrent enrollment in PHYS 342 required.

PHYS 360 Electricity and Magnetism (3-0-3), fall and as needed. Electronics magneto-statics, circuit, theory, Maxwell's equations, electromagnetic field theory, dielectrics, displacement current, current density, Poynting vector, scalar potentials, vector potentials and design applications. Prerequisites: PHYS 222 and concurrent enrollment in PHYS 463 or MATH 463.

PHYS 362 Optics (3-0-3), spring. Light, lenses, aberrations, diffraction, interference, polarization, resolving power, coherence, Fourier transforms, spectroscopy. Concurrent enrollment in PHYS 363 is required. Prerequisites: PHYS 222/223; MATH 186.

PHYS 363 Optics Laboratory (0-4-1), spring. Concurrent enrollment in PHYS 362.

PHYS 371 Classical Mechanics (3-0-3), fall. Vector methods of static systems of forces, couples and moments, particle dynamics, rigid body dynamics, work, kinetic and potential energy, momentum and the conservation laws, and Hamilton and Lagrangian methods. Prerequisites: PHYS 220; Concurrent enrollment in MATH 361.

PHYS 378 History and Philosophy of Science (3-0-3), fall, odd years. A study of Newtonian physics, evolution, thermodynamics, quantum theory, relativity, and the impact of these sciences on religion, philosophy, literature, the arts, and the social sciences. Same as PHIL 378. For non-science majors. May be used to satisfy University Requirements.

PHYS 379 Philosophy, Religion and Science (3-0-3), spring, odd years. A study of the relations of God, humans, and nature from the perspectives of philosophy, religion and science. Emphasis on the mutual impacts of science and religion. Same as PHIL 379. May be used to satisfy University Requirements. For non-science majors.

PHYS 388 Network Analysis (3-0-3), fall, odd years. Active and passive electrical networks, time and frequency domains, Fourier and Laplace transform techniques, and some non-linear circuits. Prerequisite: MATH 361. Same as ENGR 388.

PHYS 401 Secondary Science Methods (3-0-3), fall, spring. A study of teaching strategies and curriculum development for the secondary sciences. Presents the Texas Essential Knowledge and Skills, College and Career Readiness Standards, and classroom management and discipline for the science laboratory environment. Must be taken concurrently with EDUC 412 and 432. Should be taken before student teaching. Prerequisite: 16 hours of science from appropriate secondary science teaching degree plan. Same as BIOL 401, CHEM 401.

PHYS 451 Simulations and Modeling (3-0-3), spring, odd years. Advanced techniques of computing in physics, including error analysis, data fitting and analysis, adaptive quadrature and Monte Carlo methods, ordinary and partial differential equations, and finite element techniques, all with an introduction to parallel programming techniques. Prerequisites: CS 120.

PHYS 453 Pattern Recognition (3-0-3), spring, even years. Introduces pattern recognition methods and applications: decision theory, Principal Component Analysis, neural networks, linear and non-linear discriminant functions, supervised and unsupervised learning, feature extraction, Hidden Markov Models, Kalman Filters, and related methods in the area of applied computing. Prerequisites: CS 120.

PHYS 461 Nuclear Physics (3-0-3), spring, even years. Nuclei and nuclear constituents; symmetries and conservation laws; electromagnetic, weak, and hadronic interactions; nuclear models. Prerequisites: PHYS 330/331.

PHYS 463 Math of Physics and Engineering (3-0-3), spring. Partial differential equations and boundary value programs, orthogonal functions, complex variables, Green's functions, and matrix theory. Prerequisite: MATH 361. Same as MATH 463.

PHYS 472 Solid State Physics (3-0-3), fall, even years. Crystal symmetry and structures, elastic properties of solids, crystal bonding, lattice dynamics, and specific heat, optical, and electrical properties of solids. Prerequisites: PHYS 330/331.

PHYS 481 Thermodynamics (3-0-3), fall, and as needed. Fundamental concepts of thermodynamic systems. Law of thermodynamics, properties of simple compressible substances, entropy, energy availability, ideal gas mixtures and psychometrics, and thermodynamic cycles. Application to engines, refrigeration systems and energy conversion. Prerequisites: PHYS 330 and MATH 286.

PHYS 482 Topics in Physics (3-0-3), on demand. Studies in topics or techniques of current interest in physics and astronomy.

PHYS 491 Quantum Mechanics (3-0-3), spring. A beginning course in quantum mechanics covering wave mechanics, Fourier methods,

PHYS 220 Prerequisites Change

Points to Consider

The State of Texas Higher Education Coordinating Board requires completion of calculus I in order to take calculus based physics for every state school desiring state funding.

The E&P internal research on student success in PHYS 220 shows low completion rates for students who have not already completed calculus.

This prerequisite change was voted on by the E&P department and passed by a large margin.