

Approval Chart for Curriculum Changes

A = Approve I= Information Item¹ R= Advise & Respond²

Course Number PHYS 453 Pattern Recognition or Degree Plan(s) _____

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

Course title, description, and semester offered

New course number and title: PHYS 453- Machine Learning

Terms Offered: Spring, even years

New Description:

An introduction to modern machine learning techniques for data science applications. The primary focus is supervised learning classifiers such as neural networks and decision trees. Additional topics include unsupervised learning, regression, feature engineering, and a machine learning project. Significant programming is required. Prerequisite: CS 120 or ENGR 117.

Reasoning:

See attached page

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

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

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COUNCIL ³																		
	Change to a Degree Plan	Dept./School	College Academic	Deans	TEC	UGEC	UUAC	GRAD	Provost	Faculty	President	Board of Trustees						
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	President	Faculty	Graduate	UUAC	TEC	Dean	Department	Provost	Provost-Proposed Change
I	A	A	A			R	R	A	1. Major/Graduate Program – Discontinue (proposed by the Provost)
--	A	--	A			R	R	A	2. Minor – Discontinue (proposed by the Provost)
I	A	A	A			R	R	A	3. Degree – Discontinue (proposed by the Provost)

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

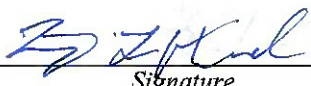
⁵ Program or course changes that apply to any major that includes Teacher Certification will be reviewed by the college, the Teacher Education Council (TEC), and then the UUAC.

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.

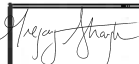
⁷ The UUAC approved the clarification that "general requirements for graduation" means the enumerated items in the "General Requirements for Bachelor's Degrees" section of the catalog.

Revised 8-26-19

Curriculum/Catalog Changes Signature Page

Department/School Chair(s)	
 Signature	2/22/22 Approval date
_____ Signature	_____ Approval date

College Academic Council(s)	
 Signature	Mar 10, 2022 Approval date
_____ Signature	_____ Approval date

Dean(s)	
 Signature	Mar 10, 2022 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

Proposed:

PHYS 453 Machine Learning

Lecture Hours: 3

Lab Hours: 0

Credit Hours: 3

Terms Offered: Spring, even years

An introduction to modern machine learning techniques for data science applications. The primary focus is supervised learning classifiers such as neural networks and decision trees. Additional topics include unsupervised learning, regression, feature engineering, and a machine learning project. Significant programming is required. Prerequisite: CS 120 or ENGR 117.

Reason for Change:

This is a long-overdue catalog update to reflect how the class and field has evolved in the last 20 years since the course was developed. "Pattern Recognition" was the common term in the late 90's (the original textbook from 2001 is called Pattern Classification), but the modern term is "machine learning" (the textbooks and software packages we've been using for the past 5 years all have machine learning in the titles). While the tools and terminology are new, the theoretical basis and course topics in introductory machine learning have changed very gradually with time. For example, neural networks became widely used in their modern form in the 80's, and the underlying statistics and mathematical concepts are much older. Therefore, this does not reflect a substantive change in course content. Adding the prerequisite option of ENGR 117 (Computational Tools for Engineering and Physics) makes the class available to engineering majors.

