



Course Approval Form

For approval of new courses and deletions or modifications to an existing course.

More information is located on page 2.

Action Requested:

Create new course Delete existing course

Modify existing course (check all that apply)

Title Credits Repeat Status Grade Type

Prereq/coreq Schedule Type Restrictions

Course Level:

Undergraduate

Graduate

College/School: Department:

Submitted by: Ext: Email:

Subject Code: Number: Effective Term: Fall Spring Summer

(Do not list multiple codes or numbers. Each course proposal must have a separate form.) Year:

Title: Current

Banner (30 characters max including spaces)

New

Credits: 3 Fixed Variable

Repeat Status: (check one) Not Repeatable (NR) Repeatable within degree (RD) Repeatable within term (RT) Total repeatable credits allowed:

Grade Mode: (check one) Regular (A, B, C, etc.) Satisfactory/No Credit Special (A, B, C, etc. +IP)

Schedule Type Code(s): (check all that apply) Lecture (LEC) Lab (LAB) Recitation (RCT) Internship (INT) Independent Study (IND) Seminar (SEM) Studio (STU)

Prerequisite(s): Corequisite(s):

Special Instructions: (restrictions for major, college, or degree; cross-listed courses; hard-coding; etc.)

Course renumbered from ASTR 530 to ASTR 730 since it is intended only for graduate students. Title change from "ASTR 530's Astrophysics" to the new ASTR 730 "Stellar Astrophysics" to better reflect content as it has long been taught. Redundancies with other graduate astronomy courses are eliminated

Catalog Copy for NEW Courses Only (Consult University Catalog for models)

Description (No more than 60 words, use verb phrases and present tense)	Notes (List additional information for the course)

Indicate number of contact hours: Hours of Lecture or Seminar per week: Hours of Lab or Studio:

When Offered: (check all that apply) Fall Summer Spring

Approval Signatures

Department Approval _____ Date _____ College/School Approval _____ Date _____

If this course includes subject matter currently dealt with by any other units, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

Unit Name	Unit Approval Name	Unit Approver's Signature	Date

For Graduate Courses Only

Graduate Council Member _____ Provost Office _____ Graduate Council Approval Date _____

Course Proposal Submitted to the Curriculum Committee of the College of Science

1. COURSE NUMBER AND TITLE:

ASTR 730 Stellar Astrophysics

Course Prerequisites:

MATH 214, PHYS 303, 305, 308

Catalog Description:

The purpose of this course is to understand the physical principles that govern the structure and evolution of stars and the properties of stellar atmospheres. The topics include stellar evolution, equation of state, radiative heat transfer, conductive heat transfer, stellar energy sources, stellar modeling, stellar atmospheres, continuum and line spectra.

2. COURSE JUSTIFICATION:

Course Objectives:

Develop an understanding of the structure and evolution of stars and stellar atmospheres, a core subject in astrophysics.

Course Necessity:

The existing title implies a broad overview of astrophysics, but for many years the course has focused only on stellar astrophysics. The set of courses ASTR 604, 660, 680, and 730 provide a balanced education in fundamental astrophysics for PhD students concentrating in astrophysics. The course number is being increased to 730 to more accurately reflect the level of the course content.

Course Relationship to Existing Programs:

The course has been cross-listed with CSI 661.

Course Relationship to Existing Courses:

Relationships to complementary courses noted above. There are no similar courses at the graduate level.

3. APPROVAL HISTORY:

4. SCHEDULING AND PROPOSED INSTRUCTORS:

JieZhang 5/28/10 12:08 AM

Deleted: .

Semester of Initial Offering:

Offered in alternate spring semesters.

Proposed Instructors:

Zhang (CDS faculty), Rosenberg, Satyapal, Weingartner

5. **TENTATIVE SYLLABUS:** See below.

**ASTR 730
Stellar Astrophysics
Syllabus**

Spring 2009

Prerequisites: PHYS 303 (Classical Mechanics), PHYS 305 (Electromagnetic Theory), PHYS 308 (Modern Physics with Applications); MATH 214 (Elementary Differential Equations)

Credits: 3

Date: Wednesday

Time: 7:20 PM to 10:00 PM

Place: Innovation Hall 137

Instructors: Jie Zhang

Contact Info: (703)993-1998 (phone), jzhang7@gmu.edu (e-mail)

Office Hour: 3:00 PM to 4:00 PM, Thursday, or by appointment

Office: Room 351, Research Bldg 1

Description: The purpose of this course is to understand the physical principles that govern the structure and evolution of stars and the properties of stellar atmosphere. The topics include stellar evolution, equation of state, radiative heat transfer, conductive heat transfer, stellar energy sources, stellar modeling, stellar atmosphere, continuum and line spectra.

Content:

- Basic Physical Principles
- Overview of Stellar Evolution
- Equations of State
- Radiative Heat Transfer
- Conductive Heat Transfer
- Convective Heat Transfer
- Stellar Energy Sources
- Stellar Modeling
- Overview of Stellar Atmosphere

- Continuous and Line Absorption Coefficient
- Model Photosphere

Homework: There will be 6 – 8 small assignments.

Project: There will be two projects. One is on the modeling of stellar structure, and the other is on the stellar atmosphere.

Exams: There will be one midterm and one final exam.

Grades: Homework (25%), Project (25%), Midterm (20%), Final Exam (30%)

Class URL:

Text Book (required): “Physical Principles, Structure and Evolution”. by C.J. Hansen, S.D. Kawaler and V. Trimble, 2nd edition, Springer-Verlag 2004.

Supplemental Text Books:

1. “Stellar Atmosphere: The Observation and Analysis of Stellar Photospheres”. By David F. Gray. Third Edition, Cambridge Press 2005