Course Code	PHYS8656 (RPG)		
Title	Topics in astrophysics		
Offering Department	Physics		
Course Co-ordinator	Dr S C Y Ng Physics		
Course Co-ordinator Email	ncy@astro.physics.hku.hk		
Teachers Involved	Name	Department	Percentage
	Dr S C Y Ng	Physics	100
Course Objectives	This course covers high energy processes, basic theory of stellar structure and evolution, and introduction to compact objects. It follows a vigorous mathematical treatment that stresses on the underlying physical processes.		
Course Contents & Topics	Topics include: Radiation mechanisms; stellar structure equations; polytropic model; elementary stellar radiation processes; simple stellar nuclear processes; stellar formation; late stage of stellar evolution; supernova explosion; compact stellar; cosmic rays; if time permits, additional selected topics will be covered.		
Course Learning Outcomes (CLO)	On successful completion of this course, students should be able to: CLO 1 describe what is stars and to classify different types of stars CLO 2 analytically calculate and solve problems related to the structure and evolution of stars including the use of stellar structure equations and Saha equations CLO 3 critically examine the physical processes occurring in stars and how these processes affect the evolution of stars CLO 4 apply physics principles to describe the physical properties of various astrophysical systems CLO 5 demonstrate knowledge and discuss the underlying physical concepts associated with the astrophysical systems and their dynamic interactive processes CLO 6 assess selected research papers in the field of stellar astrophysics		
Pre-requisites (and Co-requisites and Impermissible combinations)	Nil		
Offer in 2024 - 2025	Y 2nd sem	Examination	May
Course Grade	A+ to F		
Grade Descriptors	A: Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. B: Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. C: Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge		

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<tr><td></td><td colspan="3">to most familiar situations. Apply moderately effective organizational and presentational skills.
D: Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.
Fail: Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.</td></tr>
<tr><td>Course Type</td><td colspan="3">Lecture-based elective course</td></tr>
<tr><td rowspan="4">Course Teaching & Learning Activities</td><td>Activities</td><td>Details</td><td>No. of Hours</td></tr>
<tr><td>Lectures</td><td></td><td>36</td></tr>
<tr><td>Tutorials</td><td></td><td>12</td></tr>
<tr><td>Reading/Self study</td><td></td><td>80</td></tr>
<tr><td rowspan="5">Assessment Methods and Weighting</td><td>Methods</td><td>Details</td><td>Weighting in final course grade (%)</td></tr>
<tr><td>Assignments</td><td></td><td>10</td></tr>
<tr><td>Examination</td><td>2-hour written exam</td><td>50</td></tr>
<tr><td>Presentation</td><td></td><td>10</td></tr>
<tr><td>Test</td><td></td><td>30</td></tr>
<tr><td>Quota</td><td colspan="3">9999 (9999 if no quota)</td></tr>
<tr><td>Required/recommended reading and online materials</td><td colspan="3">Lecture notes provided by Course Coordinator
Prialnik, D.: An introduction to the theory of stellar structure and evolution, 2nd ed. (CUP, 2010)
Shapiro and S. A. Teukolsky Longair High Energy Astrophysics 3rd ed
Francis, LeBlanc, An Introduction to Stellar Astrophysics (Wiley, 2010)</td></tr>
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