Course Code	PHYS8656		
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 2023 - 2024	Y 2nd sem	Examination	May
Course Grade	Pass or Fail		
Grade Descriptors	Pass: 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. 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.		
Course Type	Lecture-based course		
Course Teaching & Learning Activities	Activities	Details	No. of Hours
	Lectures		36

	Tutorials			12
	Reading/Self study			80
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		10	CLO 1,2,3,4,5
	Examination	2-hour written exam	50	CLO 1,2,3,4,5
	Presentation		10	CLO 1,2,3,4,5,6
	Test		30	CLO 1,2,3,4,5
Quota	9999 (9999 if no quota)			
Required/recommended reading and online materials	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)			