NASSP Master's Stellar Atrophysics Course Programme 2025

Course Title:	**Stellar Astrophysics (StAst)**
Course Lecturer:	**Dr Chris Engelbrecht. [email: engelbrecht.chris@gmail.com]**
Course credits:	1
Lecturer contact hours:	24

1) Course overview:

Our understanding of stellar structure and evolution has accelerated very quickly over the past few decades, due mainly to unprecedented observational precision and huge computing power becoming available. This course provides a brief overview of some of the most important aspects of the current state of the art, with the aim of equipping students to navigate current research in the field as effectively as possible. The academic level of the course is rigorous, as befits a course at Masters level.

2) Course breakdown/syllabus:

Part A: Advanced topics in Stellar Structure

A1. Convective processes in stars
A2. How stellar rotation affects structure and internal dynamics
A3. Advanced formalism of the physics of stellar pulsation
A4. Selected physical aspects of close binary systems

Part B: Advanced topics in Stellar Evolution

B1. Overview of cutting-edge research in star formation, main-sequence evolution, and post-main-sequence evolution
B2. Stellar modelling resources
B3. Databases, and upcoming missions and programmes associated with stellar evolution

3) Mode of delivery:

An online delivery mode will again be followed in 2025. Lectures will be delivered in a combination of powerpoint/whiteboard format in the scheduled lecture timeslots. The lectures will be presented via the Zoom portal. Students assemble at a designated venue in the Astronomy Department, where the videolink will be running.

Please consult the NASSP Timetable for class times.

4) Resources:

Powerpoint notes will be emailed to the class immediately after each double lecture. Due to the online mode of delivery, the notes have been compiled in a 'conversational' style to ease students' engagement with the material. No textbook will be used; I have compiled the notes from my own background of work in stellar physics, based on a large variety of sources. All material required for exam purposes will be covered in these notes.

5) Additional skills to be developed during the course:

Many aspects of fundamental physics will be reinforced (or encountered for the first time, for some students) as we work through the course topics.

6) Assessment

There will be scheduled homework assignments, a 'Prelim' test, and a Final exam. Weights and mark allocations are still to be finalised and will be communicated to you at a later stage.