STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

COURSE OUTLINE

ASTR 104 – STELLAR ASTRONOMY LAB

Prepared By: Dr. David C. Bradford

CANINO SCHOOL OF ENGINEERING TECHNOLOGY
PHYSICS
MAY 2015

A. **TITLE**: STELLAR ASTRONOMY LAB

B. **COURSE NUMBER:** ASTR 104

C. **CREDIT HOURS:** 1

D. **WRITING INTENSIVE COURSE**: No

E. **COURSE LENGTH:** 15 weeks

F. **SEMESTER(S) OFFERED:** Spring

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:** 2 hours laboratory per week

H. **CATALOG DESCRIPTION:**
This is a laboratory course to accompany ASTR 103 –Stellar Astronomy. Laboratory exercises will both explore fundamental concepts and physical principles introduced in lecture, as well as give the students a feel for the work of a modern Astronomer with computer based simulation exercises.

I. **PRE-REQUISITES/CO-REQUISITES:**
a. Pre-requisites: None
b. Co-requisite(s): ASTR 103 (Stellar Astronomy) or permission of instructor

J. **GOALS (STUDENT LEARNING OUTCOMES):**
By the end of this course, the student will be able to:

Course Objective	Institutional SLO
a. Understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement, and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis.	**2. Crit. Thinking 4. Inter-Intrapersonal Skills**
b. Application of scientific data, concepts, and models in astronomy.	**2. Crit. Thinking 4. Inter-Intrapersonal Skills**
c. Use software to visualize and complete the mathematics associated with models, and compare to data, either real or simulated.	**2. Crit. Thinking 4. Inter-Intrapersonal Skills**
d. Organize a lab report to summarize your work and results.	**1. Communication 2. Crit. Thinking 4. Inter-Intrapersonal Skills**

K. **TEXTS:** Palen, Kay, Smith, and Blumenthal 2015. *Understanding Our Universe, 2nd Ed.,* W.W. Norton & Co., New York, N.Y. 101110-0017.

L. **REFERENCES:** Evolving on-line material and Stellarium planetarium program

M. **EQUIPMENT:** computers

N.   **GRADING METHOD:** A-F

O.   **MEASUREMENT CRITERIA/METHODS:**
- Laboratory reports

P.   **DETAILED COURSE OUTLINE:** See companion lecture ASTR 103 – Stellar Astronomy

Q.   **LABORATORY OUTLINE:**

I.   Create a scale model of the Solar System

II.   Mapping the Earth and the Celestial Sphere

III.   Light Intensity and the Inverse Square Law

IV.   Introduction to Spectroscopy

V.   Romer's Determination of the Speed of Light (computer based simulation)

VI.   Hydrogen Energy Levels (computer simulation)

VII.   Geometric Optics and Building a Refracting Telescope

VIII.   The H-R Diagram (computer based activities)

IX.   Eclipsing Binary Stars (computer simulation)

X.   Detecting Exoplanets (computer simulation)