DRAFT version 1

SYLLABUS: APPL115 *Raspberry Pi Bootcamp*

Summer Session I 2021 – 1 credit hour

Instructor of Record:

Dr. Stefan Jeglinski (Dr J)

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- 919-962-7171

Location:

Lecture/Lab: Synchronous In-person

- TWThF 10:00a-noon

TAs:

- none

Sakai: https://sakai.unc.edu/
APPL115.001.S121
click on ***Overview***

Discord: https://discord.gg/8gnkk3rz2k

Course Goals and Key Learning Objectives: The Raspberry Pi (RPi) bootcamp is an introduction to the Raspberry Pi computer platform: the software operating system, the hardware input/output (I/O) functions, and the Python computer language. The bootcamp will also include a brief introduction to the basic electronics required to implement I/O functions.

This course will introduce students to today's most popular platform that allows a computing unit to interact with the outside world and vice versa. The tools for this interaction are silicon microchips, software, sensors, a variety of analog and digital electronic components, and algorithms that anticipate and respond in ways that we perceive as NOT inherently computerized.

Instructional Philosophy. The course is structured to work best for in-person instruction; however, remote instruction is possible and will be available on some as of yet undetermined level.

Lectures. 8 lectures are scheduled. The lectures will be held in person but will also can be broadcast and recorded and posted as needed. Lectures are considered mandatory – critical information will be shared in each lecture that must be absorbed before subsequent lectures.

Homework. Most lectures will conclude with a homework assignment due the next day. The homework will be graded/evaluated at the start of the next lecture.

Project. The course will conclude with a project to be completed and presented on LDOC.

What specifically will I learn in this class, and what should I know in advance? Specifically, in addition to learning about the RPi and how it works, you'll learn elements of Python; analog/digital logic; assembly of analog/digital electronic circuits; networking and communication; sensing and data acquisition; elements of machine vision; and more. This course assumes no prior knowledge of these subjects, but it will require significant time and effort to become familiar with the different aspects. *You will be expected to spend about 25 hours outside of class during the course of the bootcamp, or roughly 3 hours for each lecture (but not necessarily each night).*

Required Materials:

- Raspberry Pi v4 (loaned by instructor)
- Secondary electronics components such as breadboards, wiring kits, etc (loaned by instructor)
- Tertiary electronics components supplied as needed by instructor
- Wireless-enabled laptop running Windows/macOS/Linux (you must supply)
- Scientific calculator: limited use in some classroom activities

Prerequisite: None. *If you have ABSOLUTELY NO physics or programming or electronics experience, this course will be more challenging, but it is designed to bootstrap those with no experience*. Contact the instructor for discussion.

Attendance. Students are expected to attend and participate in every lecture; no other attendance is required – only submission of the required homework and project for credit. If you will miss any lectures or have conflicts with either lecture or assignments, you must communicate this to the instructor, preferably beforehand, but as soon as possible under all circumstances. Students are responsible for learning any material that is missed due to absence. Valid excuses for extended absences include:

- Severe illness with doctor's or Dean's note
- Grave family circumstances
- Participating in University-sanctioned events with supporting documentation
- Travel for other classes with supporting documentation
- ***Pre-planned personal trips or family vacations are not valid excuses***

Deliverables. Each student will be expected to complete a project by the end of the bootcamp. Project requirements depend on your experience and will be outlined as the course proceeds (please fill out the demographic survey on the Sakai Overview page).

Grading. This bootcamp is pass/fail. The instructor will provide more guidance on FDOC as to what constitutes pass/fail outcomes.

Communication with Instructors or TAs. The *official* method of communication in this bootcamp is e-mail. Critical communications will be sent by e-mail or as posted announcements to Sakai that will be echoed in e-mail; however, the bootcamp will be conducted in an informal way, and informal communication is strongly encouraged via our Discord server. See the Sakai Overview page for Discord details. *Students who don't check their e-mail or Discord and who miss important communications do hereby agree to be docked accordingly*.

Honor Code:

The Honor code and the Campus Code, embodying the ideals of academic honesty, integrity and responsible citizenship, have for over 100 years governed the performance of all academic work and student conduct at the University. Acceptance by a student of enrollment in the University presupposes a commitment to the principles embodied in these codes and a respect for this significant University tradition. Your participation in this course is with the expectation that your work will be completed in full observance of the Honor Code, which can be found at http://studentconduct.unc.edu/students/rights-responsibilites.

In this course you may be collaborating with other students (see previous section), so you might be sharing data, results, and ideas; however, you are encouraged to think independently before comparing results, and any submissions for credit must be in your own words and not copied from someone else. In particular for this course, note the following:

- Individual labs or assignments in this course may be worked on collaboratively but must be reported or described by each student in his/her own words and format only.
- Exams, quizzes, or other assessments will be solely the work of each individual student.
- If you are not sure whether collaboration might constitute an honor code violation, ask the instructor for guidance.
- In contrast to the other bullets here, beware of performing others' work for them – this material requires DOING to learn. Do not dilute your grade for the sake of someone else.

Academic dishonesty in any form is unacceptable, because any breach in academic integrity, however small, strikes destructively at the University's life and work. If you have any questions about the Honor Code, please consult with someone in the Office of the Student Attorney General or the Office of the Dean of Students. Any issues that students encounter related to fairness or inappropriate conduct should be brought to the immediate attention of an instructor or TA.