

NCKU-Purdue 3+1+1 Program

Introduction to Statistical Learning (1 credits, 18 hrs)

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Lectures Time: 06:00-08:00 AM, Eastern Time (06:00-08:00 PM, National Standard Time).

Refer to Course Schedule for teaching dates.

Classroom: <https://purdue-edu.zoom.us/j/7496996026>

Office hours: By appointment only. Virtually via Zoom meeting <https://purdue-edu.zoom.us/j/7496996026>

Teaching Assistant:

Mr. Jiajun Liang (liang333@purdue.edu); Office Hours: 07:00-09:00 PM, Eastern Time (07:00-09:00 AM on the next day, National Standard Time) via zoom <https://purdue-edu.zoom.us/my/likelihood.flows>. Refer to the TA office hour section for dates of office hours

Course Description and Learning Outcomes:

This course is an introduction to the mathematical theory of statistical learning. It contains three modules: (i) basic statistical inferences, (ii) design of experiment and experimental data analysis and (iii) linear regression and advanced regression methods.

After this course, students shall gain principle understandings for basic statistical design / modeling / learning / analysis and are able to perform proper inferences for fundamental statistical models.

Prerequisites:

Knowledge of calculus, linear algebra and probability.

Texts/references:

Required Textbooks: None.

Recommended Textbook: (i) Applied Linear Regression, 4th ed, by Sanford Weisberg and (ii) Experiments: Planning, Analysis, and Optimization 2nd ed, by Jeff Wu and Michael Hamada.

Course website:

All teaching materials, homework will be posted on <http://www.stat.purdue.edu/~qfsong/teaching.html>.

Grading Rule:

Assignments (all assignments have equal weight): 40%; Final Exam: 60%. The percentage

grades needed to achieve an A, B, C, or F will follow approximately the following scale: 90–100 = A, 80 – 89 = B, 70 – 79 = C, 60 – 69 = D, below 60 is F. The instructor reserves the right to change the rule of letter grade assignment and assign “+” or “-” letter grades.

Final Exam: Time & Location TBD

Attendance, Homework, Exam policy:

- Class attendance is an important part of your success in the class. The syllabus, homework assignments, exam dates, etc. may be changed by in-class announcements. The teaching videos may be shared as a mean to help the students who are unable to attend due to reasonable excuses, but not to encourage absence from classroom. Low attendance without proper excuses may cause penalty to the final grade.
- The homework will be posted on the class website. The homework must be finished (written) independently. Discussion is okay, but identical copies are not acceptable since your homework must reflect YOUR understanding of the material. If identical solutions are found, all the parties involved will receive a 0 on that assignment. Homework shall be submitted directly on the course website.
- Students who registered with DRC can take the exam at DRC facility. Those students must contact Dr. Song asap to discuss the exam time and submit a DRC test request at <https://www.purdue.edu/drc/testing/requesting-an-exam.php>, at least one week prior to the exam date.
- Students who have schedule conflict may take the exam at a different time upon Dr. Song’s approval. Acceptable excuses include Grief, Military, Jury Duty Absences and etc. Those students must contact Dr. Song asap, and provide necessary proof.
- Students who have medical conditions on the exam date, may take the exam at a different time upon Dr. Song’s approval. Those students must contact Dr. Song asap with proper doctor’s notes. It is STUDENT’S responsibility to contact me IN ADVANCE to check if a make-up is possible. I will not accept the request of make-up exam AFTER the exam time with non-emergency excuses.

ADA, Plagiarism, Academic Integrity and Nondiscrimination Statement:

- STATEMENT ON DISABILITIES: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students

with disabilities be guaranteed a learning environment that provides for reasonable accommodation for their disabilities.

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center (DRC) at: drc@purdue.edu or by phone: 765-494-124. If you have registered with DRC and have an Accommodation Letter from DRC, or you are in need of academic accommodations, please contact me as soon as possible.

- **STATEMENT ON PLAGIARISM:** The handouts used in this course are copyrighted. By "handouts," I mean all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission. As commonly defined, plagiarism consists of passing off as one's own ideas, words, writing, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated.

- **ACADEMIC INTEGRITY STATEMENT:**

Academic integrity is one of the highest values that Purdue University holds. Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III-B-2-a, University Regulations] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." [University Senate Document 72-18, December 15, 1972].

Individuals are encouraged to alert university officials to potential breaches of this value by calling 765-494-8778. While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.

The Purdue Honor Pledge “As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do.Accountable together - we are Purdue”.

Any confirmed academic misconduct activity in this course leads to punitive grading.

- **NONDISCRIMINATION STATEMENT:** Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.
- **VIOLENT BEHAVIOR POLICY:** Purdue University is committed to providing a safe and secure campus environment for members of the university community. Purdue strives to create an educational environment for students and a work environment for employees that promote educational and career goals. Violent Behavior impedes such goals. Therefore, Violent Behavior is prohibited in or on any University Facility or while participating in any university activities.
- **EMERGENCY PREPARATION:** In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.

Guidelines regarding ensuring access to emergency information:

- Keep your cell phone on to receive a Purdue ALERT text message
- Log into a Purdue computer connected to the network to receive any Desktop Popup Alerts
- If you have a “no cell phone” in class policy allow one or two students who have signed up for Purdue ALERT to keep their phones on to receive any alerts

Course Schedule (subject to change):

Day	Date	Topic
Wed.	May 24	Review of distribution theory
Thu.	May 25	Point estimation and interval estimation
Sat.	May 27	Hypothesis Testing
Sun.	May 28	Single factor analysis
Wed.	May 31	Single/multiple factor analysis
Thu.	Jun 1	Two-level (fractional) factorial design
Sat.	Jun 3	Single linear regression
Sun.	Jun 4	Multiple linear regression
Wed.	Jun 7	Advanced regression techniques
Thu.	Jun 8	Final Exam

TA office hour (subject to change):

Day	Date	Times
Fri.	May 26	07:00-09:00 PM, Eastern Time
Sat.	May 27	07:00-09:00 PM, Eastern Time
Sun.	May 28	07:00-09:00 PM, Eastern Time
Sat.	Jun 3	07:00-09:00 PM, Eastern Time
Sun.	Jun 4	07:00-09:00 PM, Eastern Time