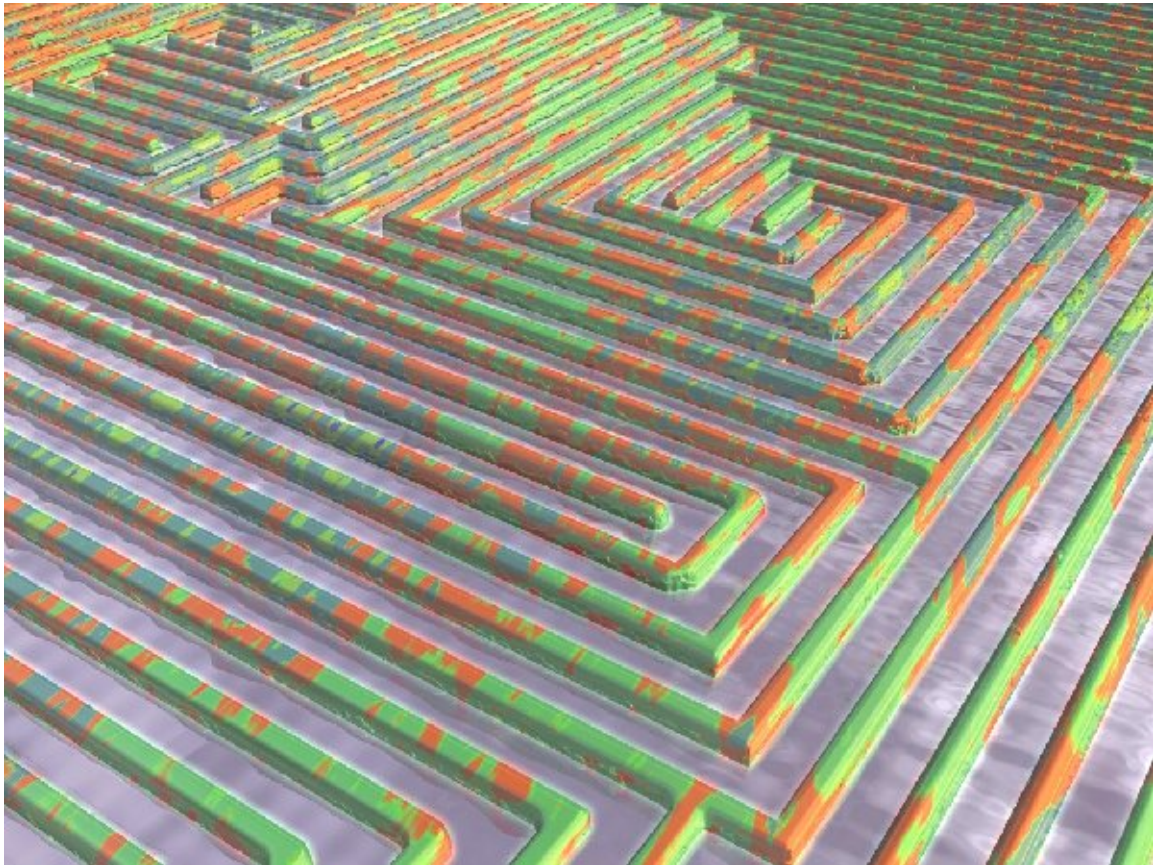


# **Rutgers University Industrial & Systems Engineering**



# **Teaching Assistant Handbook**

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## **1 About This Handbook**

This is the premier edition of the Industrial and Systems Engineering TA Handbook. The book was undertaken as a project by the TAs of academic year 2004-2005 with funding from the Graduate School – New Brunswick. The TAs in charge of this project were Ozgecan Uluscu and Hang Zhang and they put together this book with contributions by Ozlem Akpinar, Pooya Faravash, Seheon Hwang, Abdullah Karaman, Seyed Kian Seyed, Erol Zeren, and Hao Zhang. We are grateful to these TAs for their dedication, hard work, and good advice.

## **2 Some Administrative Rules**

TAs are required to work no more than fifteen hours per week. Some flexibility is required in that some weeks will require more work and others will require less.

Full-time TAs may register for 6 credits of coursework during the summer session and the tuition will be remitted using the same procedures as during the school year.

With the permission of the Graduate Director, TAs may work up to 10 hours per week in addition to their TA assignments within the university. TAs may not work outside the university.

## **3 TA English Language Requirements for International Students**

The department selects TAs from among the graduate students to teach laboratory courses and assist with grading and teaching recitations in undergraduate classes. Most of the TAs are doctoral students in our program. Occasionally, an MS student is chosen if there are no doctoral students available.

There are basically two qualifications: (1) The student must be progressing successfully in the graduate program. (2) The student must be able to communicate well in English.

To obtain a TA position international students must take the SPEAK test, a standardized test from Educational Testing Service that is given at no charge at Rutgers. Go to [http://esl.rutgers.edu/ita\\_information/tests/speak\\_test.html](http://esl.rutgers.edu/ita_information/tests/speak_test.html) for information. The SPEAK test takes twenty minutes. You will listen to an audiotape and respond to questions, both orally and in writing.

Depending on your score you will be placed in category 0, 1, or 2. Students in category 0 are allowed to teach; students in category 1 are allowed to teach but may be required to take an ESL course to continue their TA appointment; students in category 2 may not teach.

If students are on the borderline between categories 1 or 2, they will be asked to present a 45 minute “class” that is videotaped and evaluated by ESL department. Then they will be assigned to category 1 or 2.

#### **4 Steps for New TAs to get on the Payroll and Begin Work**

When you are chosen to be a TA you will receive an appointment letter. In order to best cover all our graduate students in need of funding, these appointment letters are often issued in August. Now that you have been appointed, congratulations! Here are the administrative steps to follow:

- **Arrive** on campus at least one week prior to classes.

- **Contact the professors** associated with your TA as soon as assignments are made.
- **Schedule Office Hours** if required by the professor.
- **Arrange for a desk** in Graduate Student Office by checking with Cindy Ielmini in the ISE office, CORE 201.
- **Attend to critical employment paperwork** by meeting with Helen Pirello in the ISE office, CORE Building, Room 201. Submit your signed *Assistantship Appointment Letter*. You will be given a *Tuition Remission Card (WT-100)* and you will complete important paperwork including *Payroll* and *Health Insurance Forms*.
- **Register** for classes on-line. If you are a full-time TA you will register for 6 credits per semester of 16:540:877 Teaching Assistantship. You do not pay for these credits. However they do count towards your total maximum of 16 credits per semester.
- **International students** must make sure they are in status. If you are registering for less than 9 credits, complete the *Academic Status Report: Reduced Credit or Reduced Courseload* form and return it to Center for International Faculty and Student Services located at 180 College Avenue in College Ave Campus and [www.rci.rutgers.edu/~cifss](http://www.rci.rutgers.edu/~cifss)) The six TA credits count towards the nine credits.
- **Pay your term bill** with the *Tuition Remission Card (WT-100)* at the Cashier's Office located in Administrative Service Building I, Busch Campus.

- **Organize email accounts.** Validate your university email account as soon as you register. The university will hold you responsible for messages they send to that address. Email Cindy Ielmini [ielmini@rci.rutgers.edu](mailto:ielmini@rci.rutgers.edu) and Prof. Albin [salbin@rci.rutgers.edu](mailto:salbin@rci.rutgers.edu) the email address where you wish to receive messages from the ISE department.
- **Attend** the Graduate School – NB orientation for new TAs a week before classes begin. A one-day orientation program provides a comprehensive introduction to the university and to teaching. International TAs receive an additional one-day orientation to introduce them to the U.S. educational system and its undergraduate culture, and to alert them to particular challenges they may face as foreign TAs.

## 5 Matching TAs and Course Assignments

In Industrial Engineering language, the problem of assigning TAs to courses is highly constrained! There are a number of labs and courses that must be covered, though the load is heavier in fall than spring. There are students that need assignments. We want to balance the load fairly among students. We prefer to assign students to courses where they have experience and knowledge. It is often possible to meet all the constraints but from time to time it is not. Be prepared to learn new material or attend the undergraduate classes in order to perform your duties as a TA.

## 6 Resources at Rutgers

TAP, **The Teaching Assistant Project**, a part of the Graduate School – New Brunswick, is an invaluable resource for practical advice on both teaching and administrative rules and procedures. The link is <http://taproject.rutgers.edu>

For information about the **libraries** see <http://www.libraries.rutgers.edu/>.

For **Computing Services** see <http://rucs-nbp.rutgers.edu/>.

The course management system, **Blackboard**, is popular among ISE faculty. For more information on this system see <http://tecn.rutgers.edu/blackboard/>.

## 7 Departmental Projection Equipment, Laboratories, and Photocopying

The ISE Department owns **two laptops and two projectors** for departmental use. You can reserve and borrow any of these devices for your class from Room 201, CORE Building. There is a sign out sheet and a schedule.

The ISE Department has **laboratories** equipped with various software packages for simulation, optimization, quality control, plant layout, production control, and statistical analysis, as well as basic machine tools and equipment in CAD/CAM and manufacturing automation.

You can reserve time in any of these labs for your classes. To reserve a time slot in a lab, outside of officially scheduled hours, see Cindy Ielmini in Room 201.

Here is a list of I&SE laboratories located in the first floor of the CORE Building: Information Technology Lab; Microcomputer Lab; Manufacturing Automation Lab; Manufacturing Information Systems Lab; Manufacturing Processing Lab; Quality and Reliability Engineering Lab

**Photocopies** required by TAs in their instructional duties can be made in the department office Room 201, CORE Building. However, it is inconvenient and costly to make paper copies. Use email or web distribution whenever possible.

## **8 Grading**

Most of the classes have weekly assignments, reports and projects that constitute a significant part of the class grade and your responsibility is to assist the professor in grading these. Your responsibility may include preparing solutions to assignments, keeping good records of grades, holding office hours for students who are in need, and conducting review sessions. In addition, you may proctor exams.

Clearly state your rules, criteria and expectations at the very beginning of the semester to relieve students' concerns about their grades. Give helpful comments when you grade assignments or reports. Giving partial credit encourages students. You can also give your students verbal feedback on their performance. Additionally, providing class statistics will help students to see their standings.

It is important to be consistent and objective in grading. One way to achieve this is to grade assignments question by question which is practical if you have relatively few students.

Different sections of a lab or class may be assigned to different TAs. To create a fair situation, the TAs must communicate to insure consistency among sections.

If you are recording grades then you are responsible for creating a reasonable backup system. If you use an Excel file on computer back it up on your USB drive. Blackboard is automatically backed up.

Another important issue is privacy. Do not display grades publicly on bulletin boards or unprotected websites. Do not discuss when others are present. Do not give a student's grades to anyone but the student – even if someone says they are a friend., Graded reports or tests should not be left unattended in a public area. Remember, social security numbers should not be displayed publicly.

## **9 Connecting with Students**

In the first class, you should introduce yourself to the class including your background and goals. The TA should have a friendly and helpful attitude towards students. It is important to let the students know that you care about their success and improvement. It is also very important to go through the class roster with them and call their names; this way you will become familiar with their names and faces. The student like very much when their TA remembers their names.

In order to establish a good connection with the students, you should try to know the students, their views of the course, their weaknesses and their strength. It is helpful to explain to them the importance and objectives of the course. This will help them understand that it is not only the matter of taking and passing a course, but also learning something that would be helpful for them in their career.

## **10 Academic integrity**

As TAs, one of your duties is to make sure that no integrity rule is violated. To succeed in this, you should be clear on how the assignments are expected to be done, whether any collaboration is allowed or not. In the beginning of the semester, tell the

students clearly. The following items with brief descriptions are listed as possible violations of academic integrity:

**Cheating:** Cheating is the use of inappropriate and unacknowledged materials, information, or study aids in any academic exercise.

**Fabrication:** Fabrication is the falsification or invention of any information or citation in an academic exercise. "Invented" information may not be used in any laboratory experiment or other academic exercise without authorization from the instructor.

**Facilitating Academic Dishonesty:** Students who knowingly or negligently allow their work to be used by other students or who otherwise aid others in academic dishonesty are violating academic integrity.

**Plagiarism:** Plagiarism is the representation of the words or ideas of another as one's own in any academic exercise.

**Denying Others Access to Information or Material:** It is a violation of academic integrity to deny others access to scholarly resources, or to deliberately impede the progress of another student or scholar.

If you suspect any of the integrity rules is violated, you should share it with the professor of the course as soon as possible.

## **11 Teaching Evaluations**

TAs who teach laboratories and recitations are evaluated twice per semester by the students. The first evaluation comes after about six weeks with a questionnaire written by the TAs themselves. In the past the questions have focused on the teaching

and communication skills of the TA. The second evaluation comes at the end of the semester and is the standard Rutgers University evaluation form that you have filled out many times as a student.

Since implementing the midsemester evaluation we have seen a big improvement in the performance of the TAs. As part of our accreditation requirements, our undergraduates are interviewed just before graduation about their experiences as students in the ISE department. Since implementing the midsemester questionnaires, the ratings for the TAs as a whole have improved very significantly.

The mid-semester evaluation requires the input of all the TAs. In writing the evaluation form each year, the TAs define goals for themselves. In administering the questionnaire early in the semester, the TAs get the opportunity to address problems and improve the outcome of their performance for the end-of-semester evaluation.

An interesting feature of the questionnaire is that it usually contains several questions that differentiate among the various communication skills needed to teach well, namely, knowledge of the subject, of English, and the ability to explain. This differentiation has apparently been important to our TAs who are mostly international graduate students.

## **12 The Teaching Portfolio**

For TAs that are considering an academic career, their teaching performance can make them more competitive on the job market. Prospective academic departments want to see your accomplishments in teaching as well as in research. A teaching portfolio often includes summarized results of teaching evaluations and lists of student comments

from the forms. Some TAs have initiated new laboratory exercises and a write-up of this, as a technical report, is also of value. When we receive applications for new faculty at Rutgers, teaching accomplishments are very often included. So – keep a good record of your teaching evaluations.

### **13 Connecting with the Supervising Professor**

It is the TA's job to keep in contact with the supervising professor of the course. Do not wait for the professor to approach you. Just before classes start contact your professor and arrange a meeting. Over the course of the semester keep the professor up to date on how the laboratory exercises are progressing and how well the students are performing in the class. Your feedback to the professor benefits the students and the professor. Make sure you maintain regular contact. If you are uneasy about an issue concerning cheating, speak with your professor. As problems arise see your professor right away and work out a solution together.

### **14 Courses**

Each TA assignment has different requirements due to the nature of the course and the preferences of the supervising professor. In this section we describe the typical set of responsibilities for each course. The most demanding TA assignment is ISE Lab where the TA is responsible for lecturing about and conducting practical experiences in a programming language and or software. TAs who are assigned to conduct laboratories also will find it challenging – often teaching, supervising, and organizing materials is involved. Serving as a TA for Engineering Economics is a challenge because of the large volume of students – more than a hundred. TAs assigned to courses grade homeworks,

create and post homework solutions, track grades, and answer student's questions during office hours and via email. Some TAs are asked to help with audiovisual equipment.

### **14.1 Engineering Economics**

Two TAs are usually assigned for this course. Here is an outline of the duties:

- Office hours  
1 hour 30 minutes of office hours twice a week for each TA.  
Notify the instructor about office hours so that the times can be posted on the Blackboard website.
- Grading  
Give credit if homework is submitted.  
Record results to Excel spreadsheet provided by the instructor.  
Post results on BB after each of the two exams during the semester.
- Exams  
The students receive multiple choice tests with different order of questions. The TA prepares an Excel spreadsheet with the student's answer choices & exam ID .
- Exam preparation  
Prepare exam sheets & bluebooks a week before each exam.  
Print out and staple the package of exam sheets for each set.
- Record keeping  
Record students' names and the last four digits of SSN who attend the recitation sessions as well as students coming to office hours.  
Send the recorded data to the instructor at the end of semester.
- Recitation  
Each TA conduct 4 recitation sessions - 2 in the week before each exam, and 2 more in the week of the exam, each lasting a regular class period.  
Ask department secretary to reserve classrooms for the recitations at least 3 weeks before the first recitation day

### **14.2 Manufacturing labs**

This laboratory aims to familiarize the students with material testing, metrology and machine tool operation through hands-on experiments. Therefore, TA is required to have knowledge in 3D CAD software, metrology tools, heat treatment, manual machining, and CNC machining. The duties of TA include:

- Instructions - Give brief explanation at the beginning of each lab about week's topic.
- Grading - Grade lab reports prepared by each student.

### **14.3 Work design**

This class is an introduction to Industrial Engineering course. Each Fall semester, one TA is assigned to this class to assist the professor. TA is required to have an understanding of basic IE topics such as Time Studies, Ergonomics, Facility Layout, Design Tools, etc. TA's duties are as the following.

1. Office hours:

- 3 hours per week.

- Posting the day and time on Black Board.
- 2. Black Board
  - Registering students to Black Board system.
  - Posting announcements on Black Board.
- 3. Grading
  - Homework
    - Preparing answer sheets and posting them on Black Board.
    - Posting homework grades on Black Board.
  - Exam
    - Assisting the professor grading midterm and final exam.
- 5. Exam preparation
  - Assisting the professor preparing exam questions.
  - Proctoring the exams with the professors.
- 6. Recitation
  - Conducting recitation sessions before and/or after the exams

#### **14.4 Work Design Lab**

This class is a complimentary lab for Work Design course. There are three sections of this lab and 2-3 TAs are assigned. TA is required to have an understanding of basic IE topics such as Time Studies, Ergonomics, Facility Layout, Design Tools, etc. TA's duties are as the following.

1. Office hours:
  - By appointment or specific time.
  - Posting the day and time on Black Board.
2. Grading Lab Reports
3. Instructions
  - Follow the Lab Instruction document.
  - Go through the tasks stated in the Lab Handbook and explain them to students.
6. Weekly Meetings
  - Meet with other TAs for this lab once a week to decide on the scope of the following week's lab.

#### **14.5 Quality lab**

This class is a complimentary lab to Quality Engineering. Two TAs are assigned for this lab. TAs should be familiar with Statgraphics, statistical quality control, and design of experiments. If not, refer to the textbook before the lab, get the knowledge necessary for the lab. The duties of the TAs include:

1. Software
  - Installing Statgraphics on the computers in MicroLab at the beginning of the semester.
2. Instructions
  - Go through the lab instructions by yourself before each lab. If problems found, tell the class the right way.
  - Instruct labs; be prepared to help them deal with any kind of problems they meet so that the lab can be completed in time.
3. Grading

- Grade lab reports fairly and give helpful comments.
  - Return the graded reports or midterm exam to students on time.
4. Preparing midterm exam

### **14.6 Computer control**

The materials of the course cover the architecture of microprocessor-based system, transistor, logic gate networks, Boolean algebra, number systems, assembly language programming, sensors and automatic data acquisition, actuators such as DC motors, control theory, Laplace transform, transfer function, open or closed loop control, proportional, integral and derivative controls, and programmable logic controllers. In order to assist students and grade appropriately, you must be pretty familiar with these materials. The duties include:

1. Grading homework, quizzes, and exams.
2. Answering students' questions.
3. Proctoring exams.
4. Posting the solutions for the assignments, quizzes and exams online.

### **14.7 Computer Control Lab**

This is the laboratory associated with the Computer Control course. The materials cover two parts: assembly language programming and control system simulation using Matlab and Simulink toolbox. The duties include:

1. Making sure that the hardware, including the PCs in MicroLab, microcomputers, evaluation boards, interfaces between PCs and evaluation boards, as well as the associated software (Matlab and Simulink toolbox) work properly.
2. Arranging office hours to help students with questions.
3. Giving students pre-lab instructions.
4. Monitoring laboratories.
5. Preparing and grading homework, exams, and quizzes.

### **14.8 IE Lab**

Instructor of IELab course must be able to develop both Console and Windows applications in VB. Net programming environment. Knowledge of another Object Oriented Programming (like C++ or Java) is recommended.

The duties include:

1. Lecturing. Recommended to start from the basic concepts of the programming to help the beginner students while keeping the course at a speed that attracts all students.
2. Preparing and grading assignments, and exams.

### **14.9 Manufacturing Information Systems**

The scope of this course is Database Management and Applications. Therefore, TA should be familiar with SQL language and be knowledgeable in design and

development of database in Microsoft Access. Knowledge of Visual Basic for Application (VBA) is highly recommended. The duties include:

1. Grading assignments.
2. Preparing working databases for students to use during the semester.

#### **14.10 Deterministic Models**

Topics include formulating linear programming problems, solution methodologies (simplex algorithm), and sensitivity analysis. Therefore, the TA is required to have the knowledge of elementary linear programming. The duties include:

1. Assisting students in their term project.
2. Conducting weekly problem solving section
3. Grading assignments.
4. Preparing assignment solutions
5. Holding office hours.

#### **14.11 Probabilistic Models**

Markov chains and queuing theory, and their applications on some inventory models; reliability problems are the main topics of this course. TA is required to know probability theory and introductory stochastic processes. The duties include:

1. Grading assignments.
2. Preparing assignment solutions.
3. Holding office hours and some review sessions.
4. Conducting biweekly problem solving sessions if required by professor.

#### **14.12 Facility Layout**

This class includes various methods used in Facility Layout. The TA is required to have a fundamental knowledge on Facility Layout problems. The duties include:

1. Grading assignments.
2. Assisting students on their semester projects.
3. Holding office hours.

#### **14.13 Production**

The topics covered in this course include production planning, scheduling an optimization. The TA is required to be familiar with these materials. The duties include:

1. Collecting assignments from the professor at the required time.
2. Grading assignments and return to professor on time.
3. Recording grades in the format required by professor.
4. Handing in grade records and the calculated final grade for each student to professor at the end of the semester.

**15 Who taught what last year?**

Fall 2004		Spring 2005	
Course	TA	Course	TA
201 Work Design	Ozgecan Uluscu	210 Probability	Hang Zhang
202 Work Des Lab	Abdullah Karaman, Ozgecan Uluscu Erol Zeren	303 Mfg Proc	Erol Zeren
213 IE Lab	Pooya Faravash	304 Mfg Proc Lab	Erol Zeren, Ozlem Akpinar
338 Prob Models	Abdullah Karaman	311 Det Models	Abdullah Karaman
343 Eng Eco	Seheon Hwang Wenjian Li	343 Eng Eco	Seheon Hwang, Rodrigo Duran
382 Comp Contrl	Hao Zhang	384 Simulation	Hang Zhang
383 Comp Contrl Lab	Hao Zhang, Yigit Karpat	399 Design I	Ozgecan Uluscu
400 Design II	Seheon Hwang	462 Fac Layout	Ozgecan Uluscu
433 Quality	Hang Zhang	485 Mfg Info Sys	Ozlem Akpinar
434 Quality Lab	Hang Zhang, Ozlem Akpinar		
453 Production	Ozlem Akpinar		
486 Auto Mfg	Erol Zeren		