

**San José State University**  
**Department of Aviation and Technology**  
**TECH 200 – Research Methods for**  
**Engineering and Technology**  
**Fall 2013 - Section 01**

**Contact Information**

<b>Instructor:</b>	Dianne Hall
<b>Office Location:</b>	IS 107
<b>Telephone:</b>	(408) 924-3204 (checked infrequently – use Canvas email)
<b>Email:</b>	Dianne Hall in Canvas (checked 1-2 times a week)
<b>Alternate Email</b>	<a href="mailto:Dianne.Hall@sjsu.edu">Dianne.Hall@sjsu.edu</a> (checked rarely – use if Canvas issues only)
<b>Office Hours:</b>	Wednesday 2:00 pm – 3:00 pm or by appointment
<b>Class Days/Time:</b>	online
<b>Classroom:</b>	n/a
<b>Prerequisites:</b>	STAT115 or equivalent
<b>Course Number</b>	TECH: 42315

**Faculty Web Page and MYSJSU Messaging**

Copies of the syllabus may be found on my faculty web page accessible through the Quick Links>Faculty Web Page links on the SJSU home page.

<http://www.sjsu.edu/people/dianne.hall/>

You are responsible for regularly checking with the messaging system through MySJSU.

All course materials may be found in the Canvas Learning Management System. Once you are registered for the course, you will be automatically added to the Canvas course shell. See details below for accessing Canvas. You should regularly check Canvas for updates or set the notifications feature in Canvas to notify you of changes.

**Course Description**

Current applied research methods applied to problems in engineering, technology, and other technical fields. Exposure to current literature, scientific/technological research ethics, research and experimental design and methods, skills in research proposal development and locating funding.

Prerequisite: STAT 115

## Purpose of the Course

This course is intended to give the student an understanding of the different types of research methodologies used in technical research today. Because of the complexities and diversity of research practices, this course will emphasize the most commonly used techniques. The emphasis in this course is on practicality.

This course satisfied the Graduation Writing Assessment Requirement (GWAR). These requirements may be found at the [GWAR webpage](http://www.sjsu.edu/gradstudies/policy/gwar/) at <http://www.sjsu.edu/gradstudies/policy/gwar/>

## Course Goals and Course Learning Outcomes (CLO)

### Goal

All students taking this course are expected to develop skills in evaluating research that is done by others, in addition to developing their own plans for research. The ability to evaluate research critically is important in order to avoid deriving conclusions from spurious data, or inadequate or inappropriate conclusions. In addition, students will learn how to plan and organize their research efforts so that they will be better prepared for their terminal thesis or project as a graduate student. When you begin this capstone research work, you will draw heavily on the knowledge you gained in this class.

### Course Learning Outcomes

At the successful completion of the course, the student will be able to:

CLO	Description	How Achieved
1	Use the language and vocabulary of research methods in engineering and technology studies.	Intro to Research Exercise
2	Recognize research priorities and benchmark research studies in technical content areas of interest	Précis
3	Differentiate among common research methods with respect to their applicability, usage, advantages, and disadvantages	Examine different methods
4	Outline research procedures and methods that are practical, replicable, and theoretically sound	Précis
5	Write a research proposal – specifically, a précis proposal as may be required for your thesis or project	Précis
6	Critically evaluate research done by others, being able to identify both strengths and weaknesses in design	Research Analysis
7	Use the principles of validity and reliability in analyzing and constructing research.	Research Analysis, Précis
8	Apply accepted ethical practices to their research efforts.	Plagiarism Library Exercise
9	Utilize statistical techniques to analyze research data	Précis, Research Analysis

## Library Liaison

Mengxiong Liu, Ph.D.

Email: [mengxiong.liu@sjsu.edu](mailto:mengxiong.liu@sjsu.edu)

Dr. Liu has developed a library [subject guide](#) that may be found at [http://libguides.sjsu.edu/aviation\\_technology?hs=a](http://libguides.sjsu.edu/aviation_technology?hs=a)

## Textbooks

Required	
"Research Methods for Science" Marder, Michael P. ( 2011) Cambridge University Press ISBN: 978-0-521-14584-8 (RMS)	"The Art of Being a Scientist – A Guide for Graduate Students and their Mentors" Snieder, Roel, and Larner, Ken (2009) Cambridge University Press ISBN: 978-0-521-74352-5 (ABS)
Recommended	
Publication Manual of the American Psychological Association American Psychological Association (2009) (6th. ed.) Washington, DC: Author. ISBN: 978-1-4338-0561-5 9 (softcover) Also available in other covers and electronically at the <a href="#">APA website</a> <a href="http://www.apastyle.org/manual/index.aspx">http://www.apastyle.org/manual/index.aspx</a>	

## Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in [University Policy S12-3](#) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

Detailed instructions for each assignment will be provided in Canvas (the current on line course management tool). Generally assignments are due Monday mornings at 8am but please refer to Canvas for assignment due dates and times. All assignments must be submitted through Canvas. NO assignments will be accepted late.

All work completed must be in proper English. Your grade will be lowered if excessive grammatical and spelling errors are made. Work that is not in an acceptable manner will not receive credit.

## Canvas Component

This course uses Canvas, a web based course management tool. See the SJSU academic technologies ecampus main website <http://www.sjsu.edu/at/ec/> for instructions and the location of the course management tool. Computers with high-speed internet connections are available throughout campus and at the King Library. All students must also have an active email address.

A high degree of computer literacy is required to successfully complete this course. Students who do not have a high degree of computer literacy are urged to use the resources in the **Student Technology Resources** section below so that they may be successful in this course.

*Online learning is suitable for you only if you are active and competent with both email and the internet, and if you are a self-starter. It requires a lot of self discipline and careful tracking of readings and due dates to be successful in On-line classes in general.*

### **TurnItIn / Plagiarism Avoidance**

This course uses the plagiarism checking service of TurnItIn. TurnItIn is an integral part of Canvas and assignments that need to be submitted to TurnItIn will be done so automatically. No further action is required by the student. Students will have access to the TurnItIn reports. If you have concerns about plagiarism, you should submit your assignment early. This will allow you to see the areas of concern, fix them and then resubmit the assignment before the due date.

There is a Plagiarism Avoidance module in Canvas that gives you some guidance. Please refer to it if you have any questions or concerns.

### **Illuminate/WebEx**

Occasionally, we may have on-line lectures using the on-line meeting tool Illuminate or WebEx. Instructions on how to use the Illuminate and WebEx tools will be available in Canvas if the tools are to be used.

### **Criterion / Writing Assessment**

This course uses the writing assessment tool Criterion. At this point, Criterion is a separate tool from Canvas. Assignments that require writing assessment must be submitted to Canvas and Criterion. Instructions as to how to use Criterion and which assignments must be submitted to Criterion will be available in Canvas.

### **Grading Policy**

Please see below to determine the weighting of the assignment groups and the grade distribution.

### **Activity Grade Distribution**

Within each assignment group there are several activities. Each of these activities has been assigned points. Some assignments are worth more points than others. Since not all assignments have the same points, some assignments are more heavily weighted than others. Please pay careful attention to the assignment weighting when completing your work.

Activity	Percentage Weight
Unit Activities. Each unit includes various activities, discussion questions, and responses	30
Research Analysis	10
Final Exam	20
Preliminary Précis (2)	5 each
Final Précis	30

### Grade Distribution

The final course grade distribution will be as follows:

A+	100	A	93-99	A-	90-92
B+	88-89	B	83-87	B-	80-82
C+	78-79	C	73-77	C-	70-72
D+	69	D	65-68	F	Below 65

Extra credit assignments are NOT available for this course.

I do NOT grade on a curve for any assignment or for the final course grade.

Please do not expect that falling slightly below a grade-break means you will receive the next highest grade. Grading is per the schedule listed above. The grades are final once they are posted. However, if you feel there is a transcription or recording error in calculating or recording the grade, please bring this to my attention so that I may correct it. It is highly recommended that you save all assignments and email communication for this class until your grade is calculated.

Please keep in mind that the grade you receive is strongly correlated to the effort you put into the class. You earn your grades - professors do not give grades. An "A" grade, for example, denotes excellent, not simply satisfactory, performance. If you expect a certain grade, then please put in the required effort from day one.

The standard graduate grades in most US universities are A, B, and C. An **A** means superior quality graduate work of doctoral caliber. **B** means good quality graduate work acceptable for graduate credit. Any grade of **C** or below is unacceptable for graduate work; however, the instructor will give the grade that is earned even if it is below graduate expectations.

### Classroom Protocol

This is an on-line course and as such, the classroom is virtual. You can complete the work each week when you have available time. To help you complete the large amount of work required for this course in a timely manner, there are due dates for assignments at regular intervals throughout the semester. Generally these assignments are due each week but consult the schedule of classes and Canvas for specific due dates for each assignment. Please note

that in some weeks there may be 2 assignments due. There may be both individual and group assignments in this course so some interaction with your classmates will be required.

## **Description of Major Activities in this Course**

### **Web Activities**

Each week there will be instructions for the activities to complete that week. Most of the activities will be individual but some may be group based activities. Please pay careful attention to the instructions and leave sufficient time to complete the activities each week.

### **Précis**

Some departments require that students submit a précis and present it to the faculty before they can enroll in either their thesis (299) or project (298) class. You should consider the précis to be a preliminary proposal for your final project or thesis. There is no requirement that the topic of the Précis in this class be the same as your final graduate project or thesis topic, but that is commonly the case. Successful completion of this précis assignment does not constitute approval of this topic as your final project or thesis.

At a minimum, the précis should consist of the following:

- Introduction to the Research Topic
- Statement of the Problem
- Research Questions
- Hypotheses and/or Objectives
- Methodology, and
- Abbreviated Literature Review.

At a minimum, your review of the literature should cover at least 10 research articles that are related to and support your project. While a complete review of the following literature may not have been completed, there should be an additional list of relevant research articles (a Bibliography) included in the précis. The completed Précis assignment should be at least 10-12 pages, not including references and bibliography. In practical terms, you should plan on writing a report of at least 2500 words. Your précis should be written following the writing style described in the Publication Manual of the American Psychological Association. You will also need to find out what style manual your department requires for its graduate projects and theses.

In your research proposal, you need to:

- Clearly define a problem
- Clearly provide research questions, objectives, and/or hypotheses
- Include a well-developed methodology
- Include key research in your review of the literature
- Provide information about your subjects for your study including any sampling

## Research Analysis

For the research analysis assignment, you will either select or be given a scholarly article related to a field in engineering or technology. In the first portion of your research analysis, you will answer questions about the study described in the article. Then, you will be required to conduct a review of research of related articles. Finally, you will synthesize your references and the article given into a summary of related research using APA format and guidelines. Your entire essay must be at least 1500 words. Each research analysis will be submitted to your instructor through the Assignments in Canvas and will be checked for plagiarism using turnitin.

## Final Exam

Your final exam will require you to synthesize the topics and materials covered in the course. Your final exam will be an online examination. The information for this final exam will be posted online on the Canvas site for this class.

## University Policies

### Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the current academic year calendars document on the [Academic Calendars webpage](http://www.sjsu.edu/provost/services/academic_calendars/) at [http://www.sjsu.edu/provost/services/academic\\_calendars/](http://www.sjsu.edu/provost/services/academic_calendars/). The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

### Consent for Recording of Class and Public Sharing of Instructor Material

[University Policy S12-7](http://www.sjsu.edu/senate/docs/S12-7.pdf), <http://www.sjsu.edu/senate/docs/S12-7.pdf>, requires students to obtain instructor's permission to record the course.

- “Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.”
- “Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent”

In compliance with this policy, please verbally request permission to record classes if you would like to do so. In almost all cases this will be granted. In many cases I will be recording the class myself to be posted to Canvas.

### **Academic Integrity**

Your commitment as a student to learning is evidenced by your enrollment at San Jose State University. The [University Academic Integrity Policy S07-2](http://www.sjsu.edu/senate/docs/S07-2.pdf) at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Integrity Policy S07-2 requires approval of instructors.

Please make sure you understand the difference between citing and quoting. If you use material directly from a source and do not use quote marks this is plagiarism even if you cite the source.

### **Campus Policy in Compliance with the American Disabilities Act**

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. [Presidential Directive 97-03](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at [http://www.sjsu.edu/president/docs/directives/PD\\_1997-03.pdf](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) requires that students with disabilities requesting accommodations must register with the [Accessible Education Center](http://www.drc.sjsu.edu/) (AEC) at <http://www.drc.sjsu.edu/> to establish a record of their disability.

### **Student Technology Resources**

Computer labs for student use are available in the [Academic Success Center](http://www.sjsu.edu/at/asc/) at <http://www.sjsu.edu/at/asc/> located on the 1st floor of Clark Hall and in the Associated Students Lab on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library.

A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include DV and HD digital camcorders; digital still cameras; video, slide and overhead projectors; DVD, CD, and audiotape players; sound systems, wireless microphones, projection screens and monitors.

### **Computer Systems Help Desk**

Contact the help desk of any issues with Canvas. Do not contact ecampus directly. The help desk has all the answers! (Really!)

Clark 102, 1st Floor

Phone: 408.924.2377

<http://www.sjsu.edu/helpdesk/>

### **Aviation and Technology Study Room**

The Department of Aviation and Technology has a student study room located in IS132. There are study tables and limited computer resources available for students. The room is generally available during normal business hours. If you need access after hours, please contact me.

### **SJSU Writing Center**

The SJSU Writing Center is located in Clark Hall, Suite 126. All Writing Specialists have gone through a rigorous hiring process, and they are well trained to assist all students at all levels within all disciplines to become better writers. In addition to one-on-one tutoring services, the Writing Center also offers workshops every semester on a variety of writing topics. To make an appointment or to refer to the numerous online resources offered through the Writing Center, visit the [Writing Center website](http://www.sjsu.edu/writingcenter) at <http://www.sjsu.edu/writingcenter>. For additional resources and updated information, follow the Writing Center on Twitter and become a fan of the SJSU Writing Center on Facebook. (Note: You need to have a QR Reader to scan this



code.)

### **SJSU Counseling Services**

The SJSU Counseling Services is located on the corner of 7<sup>th</sup> Street and San Fernando Street, in Room 201, Administration Building. Professional psychologists, social workers, and counselors are available to provide consultations on issues of student mental health, campus climate or psychological and academic issues on an individual, couple, or group basis. To schedule an appointment or learn more information, visit [Counseling Services website](http://www.sjsu.edu/counseling) at <http://www.sjsu.edu/counseling>.

**San José State University - Department of Aviation and Technology**  
**TECH 200 Section 01 – Research Methods for Engineering and Technology**  
**Preliminary Schedule of Topics – Fall 2013**

Week	Day	Date	Topic(s)	Related Text Readings	Associated Assignment(s) Check Canvas for due dates and times
1	WED	AUG21	*Course Introduction *Course Logistics *Canvas setup	ABS CH1	<ul style="list-style-type: none"> <li>Course Introduction</li> </ul>
1	MON	AUG26	Introduction to Research	ABS CH2, CH3 RMS CH1	<ul style="list-style-type: none"> <li>Library Tutorials</li> <li>Research Analysis</li> <li>What I Learned</li> </ul>
2	MON	SEP2	Labor Day Holiday – Campus Closed		
2	TUE	SEP3	Last Day to Drop Course without a W		
3	MON	SEP9	Literature Review	ABS CH9 RMS CH5	
3	TUE	SEP10	Last Day to Add Course		
4	MON	SEP16	Planning research	ABS CH 4, 5, 12, 13	<ul style="list-style-type: none"> <li>Faculty Interviews</li> <li>Research Questions #1</li> <li>Research Questions #2</li> <li>Preliminary Précis #1</li> <li>Preliminary Précis #2</li> </ul>
5	MON	SEP23	Experimental Design and Analysis	ABS CH 6 RMS CH2	<ul style="list-style-type: none"> <li>Precis</li> <li>SJSU Research Policies</li> </ul>
6	MON	SEP30	Research Challenges	ABS CH 7	
7	MON	OCT7	Ethics in Research	ABS CH8	<ul style="list-style-type: none"> <li>Ethics exercise</li> </ul>
8	MON	OCT14	Communication	ABS CH 10	<ul style="list-style-type: none"> <li>Speaker Series</li> </ul>

Week	Day	Date	Topic(s)	Related Text Readings	Associated Assignment(s) Check Canvas for due dates and times
9	MON	OCT21	Statistics Part 1 <b>NOTE: On – campus meeting this week. Date TBD.</b>	RMS CH3.1 – 3.4	<ul style="list-style-type: none"> <li>Statistics Exercise</li> </ul>
10	MON	OCT28	Statistics Part 2	RMS CH3.5 – 3.9	
11	MON	NOV4	Modeling Part 1	RMS4.1 - 4.3	<ul style="list-style-type: none"> <li>Modeling exercise</li> </ul>
12	MON	NOV11	Veterans Day Holiday – No class		
13	MON	NOV18	Modeling Part 2	RMS4.4 – 4.6	
14	MON	NOV25	Precis		
14		NOV28/29	THANKSGIVING BREAK		
15	MON	DEC2	Careers and Jobs	ABS CH14, CH15	<ul style="list-style-type: none"> <li>Career and Jobs exercise</li> </ul>
16		DEC 9	Conclusion	ABS CH16	
		TBD	Final		

Please note: There is a required on-campus meeting mid semester.  
Subject to change with notice