

EMSE 8000

Research Methods for the Engineering Manager (3)

This is a class designed to focus doctoral students on the elements that will contribute to their success at dissertation research. The purpose of this class is to assist doctoral students in understanding how to pursue their research, both procedurally and substantively. As such, this class will cover a variety of material that will require students to both participate in class and read outside of class independently.

2. Administrative Information

EMSE 8000 will meet Tuesdays from 6:10 pm to 8:40 pm in the 1776 G. St. classroom 168.

Instructor: Julie Ryan

Contact information: jjchryan@gwu.edu

<http://www.seas.gwu.edu/~jjchryan/>

EMSE Department -- 1776 G. St. NW Suite 101 (basement office #160)

Office hours for Fall 2013: by appointment or whenever in office

The semester runs from August 26 through Dec 19, 2013. You should not plan on leaving the campus prior to the end of the semester. The class dates are listed in the course outline. As noted in GWU University Regulations:

Attendance—Students may attend only those classes for which they are officially registered. Regular attendance is expected. Students may be dropped from any course for undue absence. A student suspended for any cause may not attend classes during the period of suspension. Students are held responsible for all of the work of the courses in which they are registered, and all absences must be excused by the instructor before provision is made to make up the work missed.

3. Emergency information

What to do if the instructor does not arrive:

- If the Instructor does not arrive for the class at the designated starting time and has not notified the class of a late starting time or the cancellation of the class, the students should wait in the classroom for at least 30 minutes before departing. One member of the class should be selected to notify the EMSE Department of the Instructor's absence by calling the EMSE Department at 202-994-7541 on the next business day.

What to do in the case of an emergency:

- All students should familiarize themselves with the emergency evacuation routes from the classroom in which the course is being taught. Pay particular attention to understanding how to egress if all power is out and there is no light. Keep in mind the various emergencies that might occur: fire, earthquake, flood, building collapse, random shooter, insane person, etc.

- In the event of an emergency evacuation of the class building, the students are to assemble in the University Yard near the Statue of George Washington. If that location is not available, a secondary meeting location will be in Kogan Plaza near Professors' Gate. Students should wait at that location until all class members are accounted for (so we know if we should send the emergency folks after someone).

General emergency preparedness information:

GW Campus Advisories. Students should check the GW Campus Advisories Web Site at: <http://www.campusadvisories.gwu.edu/index.cfm> for current information related to campus conditions, closures, safety information and any other information concerning events that may disrupt normal operations.

GW Alert. All students, faculty and staff registered in the GW banner system GW will receive emergency alerts, notifications and updates sent directly to their GW email address. If individuals elect to receive these alerts on mobile devices, they should log on to GWeb Information Web Site at <https://banweb.gwu.edu> to update their contact information to include mobile devices.

4. Credits and Contact Hours:

This course is three semester credits. It will meet for 2.5 hours, once per week, for one semester. There will be 14 contact sessions. Each student is expected to spend a minimum of 7 hours per week reading, studying, and working through examples and homework.

This course is taught at the graduate level. It is restricted to doctoral students only.

5. Specific Course Information

This course is designed to provide doctoral students with a framework for structuring and completing the documentation of their research.

For every level of education, there are assumptions made regarding skills that students already possess coming into the course. There are both general assumptions about level of knowledge and specific assumptions about skills. For this course, the general assumption is that the student is equipped for doctoral level work and specifically that:

- The student knows the structure and spelling of grammatically correct Standard English.
- The student knows the basics of probability and statistics, including descriptive and inferential statistics.
- The student knows the basics of composition, to include paragraph structure, the use and placement of thesis statements, and rhetoric.

There are no prerequisite or co-requisite courses.

6. Text Book and References

There are two (2) required texts for this class, although students are encouraged to expand their reading to other texts as may come to their attention.

Exploring Research (Seventh Edition)

by Neil J. Salkind

Publisher: Pearson Prentice Hall (copyright 2009)

ISBN: 0136011373

(available in hard and soft-cover; new and used, on on-line booksellers such as amazon.com)

A Manual for Writers of Term Papers, Theses, and Dissertations, Fifth Edition

by Kate L. Turabian

University of Chicago Press (Trd); 6th or 7th edition

ISBN: 0-226-81627-3

(widely available new and used)

There are two (2) required podcasts for this class. These podcasts are available online for free – students may listen to them on the computer or subscribe to the episodes using a client such as iTunes. There are many other worthwhile podcasts available on the subject, some of which are listed on the Blackboard site. These two, however, are mandatory and the content will be used and/or referenced on the final exam.

- AAAS. Science Update Podcast. <http://www.scienceupdate.com/index.php>
- NPR. Science Friday. <http://www.sciencefriday.com/feeds/about/>

Recommended video and audio casts:

- The Science Channel. Science Channel Video. <http://science.discovery.com/> or on iTunes.
- NPR. Environment Podcaast. <http://www.npr.org/templates/topics/topic.php?topicId=1025&ft=2&f=1025>

Software is not required for this class, although students may wish to consider the following:

- Inspiration <http://www.inspiration.com/productinfo/inspiration/index.cfm>. Yes, this is a product aimed at the high school student, but it is a very powerful way of helping you organize your thoughts to write better. A free trial is available, which is good for 30 days.
- RefWorks, “an online tool for organizing your research and creating bibliographies”. Available through Gelman Library; see <http://www.gwu.edu/gelman/service/refworks/>.
- EndNote <http://www.endnote.com/>. This is a tool that helps you organize your references. It has links to popular word processing programs. While not available free through GWU, Gelman Library does provide training support for the package. See <http://www.gwu.edu/gelman/guides/endnote/>.
- SAS Software. Available for educational purposes to the GWU community. See <http://citl.gwu.edu/pages/sas.html> for instructions on how to get a copy of SAS. For information about SAS, see <http://www.sas.com/index.html>.

There are two (2) optional texts for this class:

PDQ Statistics

by Geoffrey R. Norman, David L. Streiner

BC Decker; 3rd edition

ISBN: 1-55009-207-3

publisher's website: <http://www.bcdecker.com/productdetails.aspx?BJID=121>

(available in soft-cover, new and used, on on-line booksellers such as amazon.com)

The Great Betrayal : Fraud in Science

by Horace Freeland Judson

Publisher: Harcourt; 1st edition (October 11, 2004)

ISBN: 0151008779

7. Course Learning Objectives:

At the end of this course, students will be able to

- Define and describe doctoral level research
- Describe the administrative processes associated with getting a doctor of science degree from the EMSE department at GWU
- Identify research methods appropriate to doctoral level research and characterize positive and negative aspects of each method
- Define academic integrity and describe ways to avoid violating academic integrity
- Describe the administrative processes associated with getting IRB approval for research
- Structure and conduct a literature review for a research topic
- Use both the physical and virtual elements associated with Gelman Library and Aladin
- Write and defend a research proposal
- Conduct research and analyze data
- Define and discuss descriptive statistics in the context of research
- Define and discuss inferential statistics in the context of hypothesis testing
- Write and submit a report on research conducted
- Define and describe peer-review and journal publication processes
- Write and defend a dissertation

8. Assessment of Course Outcomes:

The focus of this course is on the integrative development of the skill sets needed to complete doctoral research, as documented in a dissertation. Assessment will be made through course conduct, completion of assignments, and a final examination. Details of assignments and expectations are provided in an appendix to this syllabus.

9. Class Requirements and Grading/Evaluation Methods:

Grading will be based on the following elements with the weights as noted. Please note that individual grading templates are provided with each assignment description.

- CITI Training 10%

- Proposal 40%
- Research Method 20%
- Final Exam 30%

10. Course Topics and Schedule:

As this is a doctoral level course, reading assignments are neither made nor enforced. It is expected that students will read the material as soon as possible and refer back to it during the course of the class as needed.

Class	Date	Work Due/Exam
1	Aug 27	
2	Sept 3	
3	Sept 10	CITI Training
4	Sept 17	
5	Sept 24	Research Method
6	Oct 1	
7	Oct 8*	
8	Oct 15	Chapter 3
9	Oct 22	
10	Oct 29	Chapter 4
11	Nov 5	
12	Nov 12	Chapter 2
13	Nov 19	
14	Nov 26	Entire Proposal
Final	Dec 17	Final Exam

11. Computer Usage:

Students may use computers in SEAS laboratories, University laboratories, or at home.

Policies and Other Information

Disabled Students:

Please be aware that faculty members are not empowered to make decisions regarding the treatment of students with disabilities of any sort. Any student who has a disability or is in need of special consideration must inform the instructor of this need within the first week of class (or immediately if the disability appears after the first week of class) so that appropriate arrangements can be made in accordance with University Policies and Regulations. This includes students with reading or learning disabilities who may require extra time on tests. In all cases, the student must communicate with the Disability Services Center and have registered the disability with the University. See <http://gwired.gwu.edu/dss/> for more information.

Policy on missing class:

Students are expected to attend each class. If you must miss a class for one reason or another, you take on the responsibility to make other arrangements to make up the material. Scheduling a tutoring session with the instructor for a one-on-one private class is **not** an appropriate plan. Appropriate plans would include getting notes from one or more classmates and scheduling a group study session with your classmates to review the material. If the class you missed was one in which an exam was given, you must make arrangements with the instructor to take a make-up exam. Make up exams will be significantly different than the exams given in class.

Academic integrity:

Academic integrity is central to the learning and teaching process. Students are expected to conduct themselves in a manner that will contribute to the maintenance of academic integrity by making all reasonable efforts to prevent the occurrence of academic dishonesty. Academic dishonesty includes, but is not limited to, obtaining or giving aid on an examination, having unauthorized prior knowledge of an examination, doing work for another student, and plagiarism of all types.

Ignorance is no excuse.

The number one problem that students run into with regards to academic integrity is plagiarism. It is not okay to copy, use, or otherwise exploit other people's ideas, words, or creations without giving them credit in the proper form. Sometimes this means you must use quotation marks, while other times a simple source citation will do the trick. Changing a few words in a paraphrase is not enough to turn source material into "your own words" – in fact, that's a really bad idea to even try. Changing the phrasing order of sentences is not okay and using the thesaurus to find ways to change "happy" to "glad" is also a very bad idea.

It is expected that students know how to correctly quote and cite material, and also how to write well. For those students who need assistance, the GWU Writing Center is available. See <http://www.gwu.edu/~gwriter/>.

There is no such thing as “ boilerplate” or “standard language” in academia. Students are expected to write their reports themselves, using their own language and their own formulation. If it is necessary to use material from other sources, it is expected (and mandatory) that the standards of academic style and integrity will be followed. This includes glossaries and appendices.

Guidance on Plagiarism

Every semester, someone turns in plagiarized material as part of an assignment. When confronted, the shocked looks and consternation are usually accompanied by some version of one or more of the following explanations:

- “I didn’t think the same rules applied to the project/homework.”
- “I thought using a sentence was okay.”
- “I noted the source, even if I didn’t use quotation marks. I thought that was enough.”
- “It’s not plagiarized, it’s paraphrased – see, I changed some of the words.”

None of these explanations excuses the student from the reality that plagiarism has occurred. Here are some examples of what is not okay. In this table, the student submission is in the first column while the original text is in the second column. The text that is identical is underlined.

EVERY ONE OF THESE EXAMPLES IS CONSIDERED PLAGIARISM.

EVEN IF YOU INCLUDE THE CORRECT SOURCE, YOU MAY NOT USE EXACT WORDS UNLESS YOU USE QUOTATION MARKS OR INDENTS!

Student Work	Original Text
Another effective technology is <u>Gasification</u> . It <u>is</u> commonly called ‘partial combustion’. This <u>process devolatilizes solid or liquid hydrocarbons, and converts them into a low or medium BTU gas.</u> (Klein 2002)	Gasification is a process that devolatilizes solid or liquid hydrocarbons, and converts them into a low or medium BTU gas. Klein, Alexander. “Gasification: An Alternative Process for Energy Recovery and Disposal of Municipal Solid Wastes” M.S. Thesis, Columbia University May 2002
This process works more effectively with the types of MSW consisting of sewage sludge, plastics, wood, tires, or agricultural wastes. It <u>generates a fuel gas that can be integrated with combined cycle turbines, reciprocating engines and, potentially, and then it converts fuel energy to electricity.</u>	Finally, gasification generates a fuel gas that can be integrated with combined cycle turbines, reciprocating engines and, potentially, with fuel cells that convert fuel energy to electricity more than twice as efficiently as conventional steam boilers. Klein, 2002 (noted above)
<u>Looking at industrial practice during the past decade nothing appears to have had such a great impact on organizational innovation as the growing market of application software packages such as enterprise resource planning (ERP) systems. The aim of the application of information technology (IT) is the profound improvement of the economic efficiency and effectiveness of all business processes</u> (Scherer, 2000). ERP systems such as <u>SAP, Oracle Business Suites, PeopleSoft, Baan and J.D. Edwards</u> were originally designed to increase organization internal efficiency by streamlining the day-to-day business process.	Looking at industrial practice during the past decade nothing appears to have had such a great impact on organizational innovation as the growing market of application software packages such as SAP, BAAN, Peoplesoft or J.D. Edwards. This growth is hardly imaginable but through its connection to the concept of reengineering. The aim of the application of information technology (IT) is the profound improvement of the economic efficiency and effectiveness of all business processes. Scherer, Eric “The knowledge network: knowledge generation during implementation of application software packages”, Logistics Information Management Vol 13, Iss 4, 2000

<p>As Senge (1990) reported, <u>teams are the fundamental learning units. Team learning starts with dialogue, which is the ability of team members to suspend assumptions and judgment and enter into a free flowing dialogue in which different ideas can be explored together. This means that it is essential to develop an understanding of the practices that encourage as well as hamper such a dialogue.</u></p>	<p>Team learning is vital according to Senge[4], because in a modern organization, teams are the fundamental learning units. The paradox of teams is that they can both perform well below or well beyond the capacity of any one individual. Senge feels the discipline of team learning confronts this paradox. Further, team learning starts with "dialogue" which is the ability of team members to suspend assumptions and judgement and enter into a free flowing dialogue in which different ideas can be explored together. This means that it is essential to develop an understanding of the practices that encourage as well as hamper such a dialogue.</p> <p>Appelbaum, Steven H. and Lars Goransson "Transformational and adaptive learning within the learning organization: a framework for research and application", <u>The Learning Organization Vol 4,Iss 3, 1997</u></p>
<p>Nikolenko and Kleiner (1996) argue that <u>in a functional hierarchy of a vertically built company, individual jobs and information flow are geared towards control. The crossfunctional teams of the horizontal company do not require the same level of formal managerial control because their work is aligned with customers' needs, and "controlled" by a judgment of the final result.</u></p>	<p>In a functional hierarchy of a vertically built company, individual jobs and information flow are geared towards control. The cross-functional teams of the horizontal company do not require the same level of formal managerial control because their work is aligned with customers' needs, and "controlled" by a judgement of the final result. If the teams are arranged to complete their projects in parallel (from start to finish), thus minimizing subdivision of the processes, the hierarchy becomes flattened.</p> <p>Nikolenko, Alexander and Brian H. Kleiner, "Global trends in organizational design", <u>Work Study Vol 45,Iss 7, 1996</u></p>
<p>However, this diversity of knowledge is not always in the benefit of the team, unless carefully dealt with as reported by <u>Proehl (1996). Proehl indicates that cross-functional teams face challenges that intact work teams do not. This is largely because the projects are not directly related to the members' immediate work, and members have many competing responsibilities and varying degrees of immediate management support for participating in organizational initiatives.</u></p>	<p>Proehl (1996) comments that cross-functional teams face challenges that intact work teams do not, largely because the projects are not directly related to the members' immediate work, and members have many competing responsibilities and varying degrees of immediate management support for participating in organizational initiatives.</p> <p>Bishop, Suzanne K. "Cross-functional project teams in functionally aligned organizations", <u>Project Management Journal Vol 30, Iss 3, Sep 1999</u></p>
<p>Shum (1997), on the other hand, acknowledges that <u>knowledge work is increasingly interdisciplinary. The different backgrounds, assumptions and agendas that members bring to a team can be extremely creative, but the inevitable conflict, debate, negotiation and compromise involved in reaching such creative solutions must also be acknowledged. This process can then be turned to the team's advantage.</u></p>	<p>Fourthly, knowledge work is increasingly interdisciplinary. The different backgrounds, assumptions and agendas which members bring to a team can be extremely creative, but the inevitable conflict, debate, negotiation and compromise which is involved in reaching such creative solutions must also be acknowledged; this process can then be turned to the team's advantage.</p> <p>Shum, Simon Buckingham, <u>Negotiating the Construction and Reconstruction of Organisational Memories. Journal of Universal Computer Science, 3 (8), 1997, pp. 899-928</u></p>
<p>An example of Information Security and its applicability in this highly volatile information age involves <u>governments and private businesses, which typically accumulate large amounts of confidential data about their employees, customers, products, research, and financials. Most information is often processed and stored electronically and then transmitted across networks to other computers. Should confidential information about a businesses customers, finances or new product line be compromised by a hacker or competitor, such a breach of security could lead to a potential loss in business, law suits, and severe financial damage.</u></p>	<p>Governments, military, financial institutions, hospitals, and private businesses amass a great deal of confidential information about their employees, customers, products, research, and financial status. Most of this information is now collected, processed and stored on electronic computers and transmitted across networks to other computers. Should confidential information about a businesses customers or finances or new product line fall into the hands of a competitor, such a breach of security could lead to lost business, law suits or even bankruptcy of the business.</p> <p>Source: Wikipedia Information Security Definition</p>

<p>All permitted MSW incinerators are regulated for opacity (how dark or thick the smoke is), particulate matter emissions, and toxic air emissions. (NH DES 2000)</p>	<p>All permitted MSW incinerators are regulated for opacity (how dark or thick the smoke is), particulate matter emissions, and toxic air emissions.</p> <p>New Hampshire Department of Environmental Services, "Air Emissions in New Hampshire: Municipal Solid Waste Incinerators" published electronically at http://www.des.nh.gov/factsheets/ard/ard-20.htm</p>
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Assignments

As noted in the learning objectives statements, there is a lot of material to cover in this course. These assignments have been designed to help each student achieve those learning objectives through a combination of experiential and exploratory learning styles.

Final Exam (30%)

The final exam will be based on the material in the textbook, the podcasts, and the lectures. It will be closed books and closed notes.

CITI Training (10%)

All investigators (including Professors) conducting research at the George Washington University are required to have completed research ethics training. In fact, the fun never ends: recertification is required every year. In order to complete this training, follow the instructions given below. When you have successfully completed the training, you will be presented with a certificate. Print the certificate, using the handy print option provided. Provide that certificate to the course instructor to receive credit for having completed this assignment.

The CITI Course is at <http://www.citiprogram.org/>.

Instructions are at <http://citiprogram.org/citidocuments/citiinstructions.htm>

- Enroll in the Learner Group “Social & Behavioral Research”
- On the Learner Menu choose Basic CITI Course (or a CITI Refresher Course).
- The required and optional modules are listed in the Grade Book.
- Complete the required modules and associated quizzes.
- Complete any optional modules that may be of interest to you.

The Basic Course should take about 4-6 hours to complete but you can use multiple sessions to complete it.

Research Method Presentation (20%)

Each student will prepare and present information related to a research method or data analysis method. The instructor will assign each student a method or tool. Students may swap assignments if so desired. No one may present the same method or tool, however. The student will teach the assigned method in a one-hour long presentation. The material, including the worked example, must be the student’s original work. Excessive quotations or reliance on other people’s work will result in a low grade.

The content must follow the following outline:

- Background information on the method
- Appropriate uses of the method, including examples
- Details of the method
- Limitations and problems associated with use of the method
- A small original worked example of the method in detail, using notional data if appropriate

Grading will be accomplished as follows: each student will grade the presentation, which will serve as input to the instructor's assessment of the presentation. Please note: in order to get an A on this effort, all aspects of the presentation must be outstandingly excellent. Ordinary, normal work will receive a B. Less than average work, including mistakes or lack of understanding of the material, will result in lower grades as appropriate.

Draft Proposal (40%)

Each student will begin work on a research proposal. Assistance will be provided in selecting a focus for this effort. The format for the written document is in accordance with the SEAS Dissertation Style Guide, available for download at http://www.seas.gwu.edu/shared/dissertation_guide_2008.pdf.

Important bits:

The text of the report must follow the outline provided.

For source citations, you must use the parenthetical reference (PR) and reference list (RL) style (also known as the author-date system). This is not negotiable – please don't try. No, you may not use APA style. No, you may not use IEEE style.

Please review the material on plagiarism in this syllabus very carefully. All papers will be carefully checked for plagiarism; all noted instances will be immediately referred to the Office of Academic Integrity.

The elements of the proposal will be due incrementally as noted in the Course Plan. The incremental elements due will not be graded, but will be commented on. You should use this feedback to make your final deliverable better. Please note: efforts will be downgraded for the following reasons:

- Flawed (or no) logic
- Unsupported assertions (UA): if you write a sentence that purports to be a statement of fact or truth, you must provide some sort of evidence that your reader can use to adjudicate the factuality or truthfulness of the statement. This evidence can be in the form of one or more source citations or it can be in the form of data.
- Hypotheses that are not in standard, testable form. See page 25 of the textbook.
- Spelling and grammar errors: All writing should be in grammatically correct standard English, following the rules of standard English rhetoric. You may not write in government-ese, contractor-ese, or bullet points. You must have transition sentences, explanations of data, and descriptions of material in readable format. Subject headings do not count as part of sentences or as paragraphs. Also, please watch out for wandering commas. Apparently there is a malfunction at a comma factory somewhere and many extra commas are roaming the land, forlornly looking for a place to live. Unfortunately, most commas don't have a clue when they are wanted or not wanted and so grammatically awkward situations result. An example of this problem is illustrated by the classic panda joke, which you can access at: <http://eatsshootsandleaves.com/esl.html>
- Format. Please note that the body of the text is not indented. Additionally, if you present material in a table or a graph, the material must be described and explained in

the surrounding text. The concept you should keep in mind is that the text should be able to stand alone without the tables or figures and still be coherent.

Research Proposal Outline and Length Suggestions

Outline Element	Length
Abstract	3 paragraphs, 350 words total
1. Introduction	
1.1 Statement of the Problem	1 – 2 paragraphs
1.2 Organization of the Document	1 paragraph
1.3 Background	2 – 4 paragraphs
1.4 Purpose	1 paragraph
1.5 Significance	1 paragraph
1.6 Scope and Limitations	2 paragraphs
2. Literature Review	
2.1	Variable
2.i	Variable
2.j	Variable
3. Research Goals and Hypotheses	
3.1 Research Goals	3 – 5 paragraphs
Figure 1. Theoretical Context Diagram	
3.2 Hypotheses	Variable
Major Hypotheses	
Minor Hypotheses	
3.3 Data Requirements for Research	Variable
Figure 2. Data Requirements Trace Matrix	
4. Research Method	
4.1 Research Plan	5 – 10 pages
4.2 Data Collection Procedures	5 – 10 pages
Figure 3. Data Collection Trace Matrix	
4.3 Analysis Procedures	5 – 10 pages

4.4 Schedule and Budget	2 – 3 pages
5. Expected Findings	
5.1 Planned Descriptive Statistics	1 page
5.2 Planned Inferential Statistics	1 page
5.3 Post Hoc Analysis Possibilities	2 – 3 paragraphs
5.4 Expected Conclusions	2 – 3 paragraphs

If you are not familiar with the term “post hoc”, please refer to the textbook for guidance. Additionally, you will find excellent information at the following websites:

- <http://www.junkscience.com/news/sws/sws-chapter5.html>
- <http://www.bmj.com/cgi/content/full/325/7378/1437>
- http://en.wikipedia.org/wiki/Post-hoc_analysis

The abstract is very formulaic. It should follow this guidance and be no longer than 350 words maximum:

- The first paragraph should state precisely the research question and purpose for the proposed research. This should include a statement of why it is important (in other words, who cares?).
- The second paragraph should state how the research is proposed to be accomplished (e.g., the research method and plan).
- The third paragraph should state what findings are expected to be discovered and how unusual findings will be handled.

This format makes it easy to convert into an abstract for your dissertation, which should be equally formulaic but in describing what has been done rather than what is planned to be accomplished.

Guidance for the literature review:

The literature review is a critical component to research. When you write a journal article for peer review, your dissertation, or other research articles, it is expected that a literature review will be included. The literature review is a synopsis of what has been done in the field. It is a sophisticated description of the growth and expansion of ideas. What it is not is a series of mini book reports. As such, part of the grading of this assignment will be the skill with which the ideas are extracted from the literature and presented in a logical fashion, which draws the reader from a strong thesis statement through a series of rhetorical arguments to a derived conclusion. (If that sentence did not make sense to you, please study the links provided below.)

When crafting your review, consider the following elements:

- 1) the contents of the source material -- what are they about?

Do not simply say “first they talk about this. Then they talk about that. Etc” Explain the contents of the material in your own words to tell a story. Start that story with an informed opinion that will guide your reader – a well-crafted thesis statement.

- 2) what research methodologies, if any, were used or described?
- 3) what were the critical findings or conclusions?
- 4) what are the most important analytical conclusions?
- 5) were any contradictions noted?
- 6) are there any obvious holes in the research area?

For specific guidance on how to write a review of a document, please see the following sources:

- http://www.waikato.ac.nz/library/learning/g_review.shtml
- <http://www.unc.edu/depts/wcweb/handouts/review.html>

For those of you who are a little rusty on what a thesis statement is, please see the following sources:

- http://www.indiana.edu/~wts/pamphlets/thesis_statement.shtml
- http://owl.english.purdue.edu/handouts/general/gl_thesis.html

For those of you who are a little rusty on how to craft a well reasoned argument, please see the following sources:

- <http://www.unc.edu/depts/wcweb/handouts/argument.html>
- <http://cctc2.commnet.edu/grammar/composition/argument.htm>

For those of you who are a little rusty on what a research paper looks like in terms of structure, please see the following source:

- <http://depts.gallaudet.edu/englishworks/writing/turabianguide.html>

For those of you who are a little rusty on writing in general, please see the following sources:

- <http://www.uottawa.ca/academic/arts/writcent/hypergrammar/paragrph.html>
- http://www.english.udel.edu/wc/handouts/writing_paragraphs.html

The GWU Writing Center

- <http://www.gwu.edu/~gwriter/>

The University Writing Program website on Intellectual property

- <http://www.gwu.edu/~uw20ip/i-prop.htm>