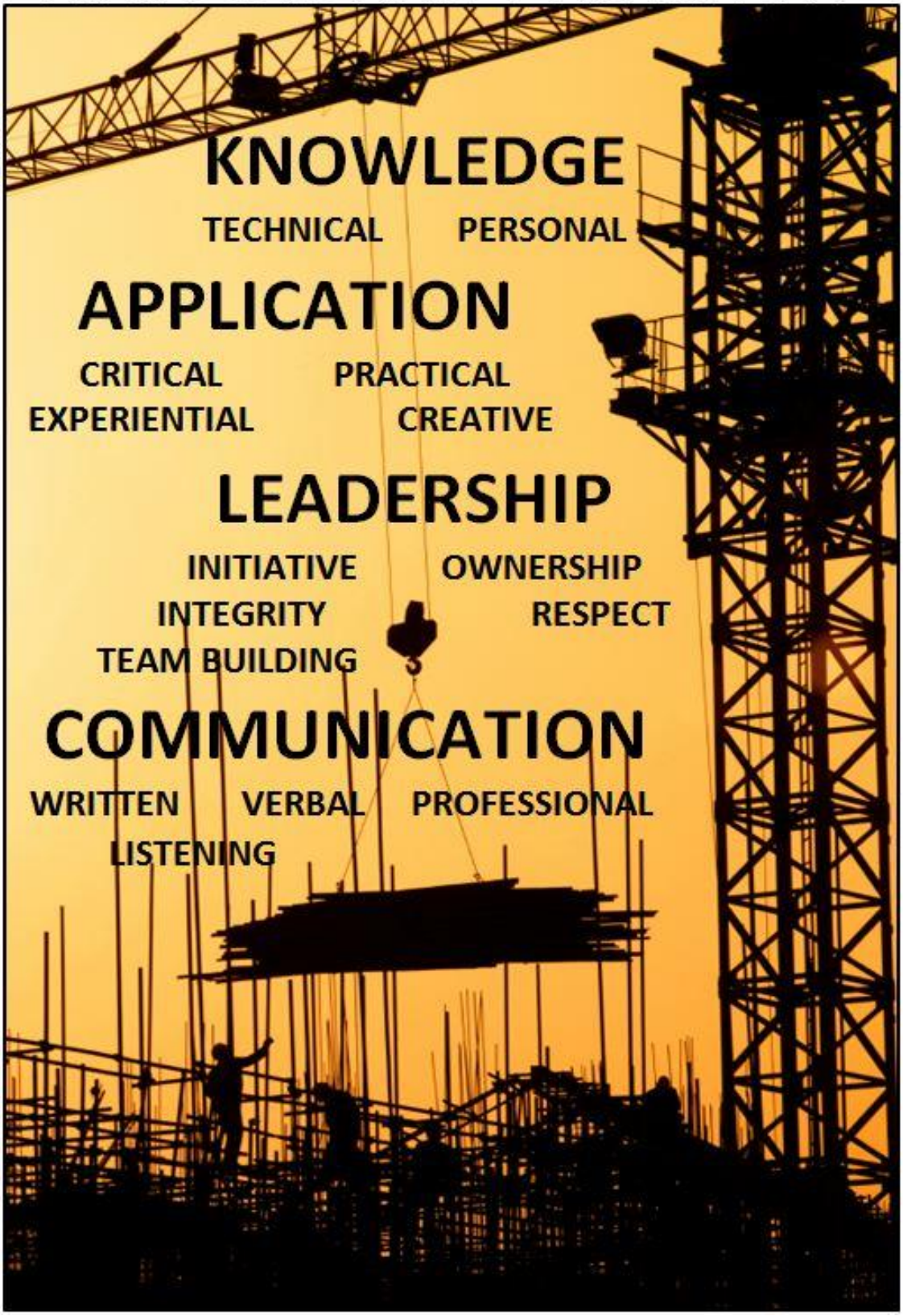
INDUSTRY READY



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Ready[1]
adjective \ˈre-dē\
: prepared to do something

: properly prepared or finished and available for use

: almost about *to do* something

Are you *ready* to take that first step into your chosen field of the professional world? If you were to begin your career today, would you be *ready* to succeed? At this point in your life, the answer is most likely "*no*".

However, the fact that you are right here, reading this booklet, signifies that you understand your need to be *properly prepared to do something* great in the industry. The faculty of the Institute of Engineering at Murray State take the word "*ready"* very seriously. The reason why we are serious is because we have been, and still are, members of this professional world that you as a student are *preparing for* right now. We know exactly what it takes for you to *be ready* to succeed in the real world because we also took that first step into it years ago. We know what your future employers will require of you because we have been (and in some cases still are) those employers who hire graduates for the very positions that you will seek in just a few short years.

To help us best communicate the level that you must reach, at a minimum, to be a successful entry-level industry professional when you graduate from Murray State, we have adopted the phrase "Industry Ready". Everything that we do - the seemingly relentless flow of work, the "nit-picky" grading, the strict deadlines, and the "tough love" you endure - is actually targeted at this mission and privilege that we as your teachers have signed up for: to grow you and help you up to the level of *industry ready* when you leave. If we do not accomplish this mission, we have failed you, ourselves, our university, and the industry and community we serve.

As illustrated in the logo above, being *industry ready* in the Institute of Engineering means you have clearly demonstrated competency in the following areas:

Essential Employability Qualities/Skills:

1. Communicators (Communications)

Graduates express ideas and information coherently and appropriately in a variety of modes appropriate to work-based settings, including in writing, orally, interpersonally, and in presentations. Graduates participate in discussions by listening actively and responding constructively. They demonstrate competence in engaging with others from cultural backgrounds different from their own.

2. Thinkers and Problem Solvers (Thinking and Problem Solving)

Graduates exercise initiative in applying critical and creative thinking skills to identify and address complex work-related problems. Graduates accurately apply quantitative, financial, data, and technical fluency, and demonstrate cultural competence in addressing work-based situations. Graduates are system thinkers and demonstrate an ability to understand concepts

[1] "Ready." *Merriam-Webster.com*. Merriam-Webster, n.d. Web. 10 May 2014. <http://www.merriam-webster.com/dictionary/ready>.

and perspectives across multiple disciplines and different cultures.

3. Inquirers (Inquiring)

Graduates conduct inquiry and research by reviewing, evaluating, verifying, citing, and applying multiple sources of information and perspectives to help address work-based problems or to perform tasks. Graduates generate new ideas through independent or collaborative inquiry.

4. Collaborators (Collaboration – Team work)

Graduates engage in teams and groups and work effectively and willingly in collaboration with others both in person and virtually. Graduates seek a range of points of view, are willing to modify their perspectives, and they help resolve conflicts where appropriate. Graduates work effectively with colleagues from diverse backgrounds and cultures, individually or in groups. They exhibit cross-cultural competence in working with others. Graduates take initiative in leading work-based groups, and/or follow direction from others as appropriate.

5. Adaptable (Adapting)

Graduates approach new or unfamiliar work-based situations and uncertainty with agility and openness. Graduates explore, learn, and apply new roles, ideas, perspectives, approaches, tools, technologies, and strategies to support their effective work-place contributions. They understand the implications of an increasingly globally interconnected world, and can work effectively across a variety of environments, cultures, and perspectives.

6. Principled and Ethical

Graduates make reasoned, ethical decisions about work-based situations or problems. Graduates act equitably and with integrity and honesty, with a strong sense of fairness and respect for individuals, groups, and broadly diverse communities.

7. Responsible and Professional

Graduates establish priorities and manage their time to meet the obligations of work-related assignments with a minimum of external supervision or direction. Graduates carry out their responsibilities consistently, persistently, reliably, and maintain appropriate confidentiality. Graduates take responsibility for their own actions and the consequences that accompany them.

8. Learners

Graduates adopt new tools (technologies or strategies) for working more effectively, analyzing work-based situations, or making decisions. Graduates continually develop themselves professionally, interculturally, and personally. They assess and understand their strengths and areas for improvement in order to support their learning and professional development. Graduates seek out and engage in formal and informal professional learning opportunities on a continuing basis and actively apply learning from these opportunities to work-related assignments.

The bottom line is that if college was easy, everyone would do it. The fact is that it *is not easy*, which is what makes it a valuable pursuit. Maximize this value by challenging yourself and allowing others to challenge you each day of your college career. Stretch yourself, and you'll be

amazed at how much you grow. Trade temporary setbacks for permanent paybacks. Settle for nothing less than excellence. Ask questions. Take ownership. Step outside your comfort zone. Avoid the path of least resistance and *intentionally* do hard things. It may sound cliché, but in a few short years you will be glad you did as you enter your career heads and shoulders above your competition, and 100% *INDUSTRY READY!*

Academic Honesty

While obtaining the necessary educational background to become ***INDUSTRY READY***, one character trait that you will need to hone is your professional ethics. The manner in which this is addressed in your classroom setting is academic honesty.

As future leaders of our professions, it is important for you to realize that your chosen careers will often be accomplished either as a licensed individual or under the guidance of a licensed individual. In any licensing situation, there will be a state board that issues you or your employer's license. Obtaining that license is a privilege and not a right. You may only continue to be licensed by following the required statutes and regulations in place governing your license. When you are issued a license, you agree to act in a professionally ethical manner. If you are a member of a state or national organization representing your profession, there will be an oath accepting that one must act in a professionally ethical manner. You should always try to represent your profession and yourself in a positive manner. As a student, that is accomplished through academic honesty.

Murray State has an academic honesty policy in place that can be found at:

http://www.murraystate.edu/Libraries/COB_Documents/Academic_Honesty_Policy.sflb.ashx

The MSU policy addresses the following forms of academic dishonesty:

> Cheating – using unauthorized sources of information on a homework, quiz, or test. This would include items such as "cheat sheets", electronic media, your classmate's paper, etc...
>
> Fabricating or Falsifying – making up information. Such as including a citation or source that either does not exist or does not state what is quoted.
>
> Multiple Submissions – submitting the same or substantially the same work for more than one assignment without notifying the instructor that the work was done for another course.
>
> Plagiarism – presenting another's work as if it were your own creation. Failing to properly credit a source of information.

When you practice academic dishonesty, you are really showing disrespect for not only your professor, but also your classmates and yourself. Your classmates may have put in more effort and actually earned the grade they received. If you cheat, you have not earned your grade and you have not gained any valuable knowledge about the tested subject. You will not be ***INDUSTRY READY***. Any act of dishonesty in your professional life can open your company up to civil action or can result in disciplinary actions against any professional licensed by a state board of licensure.

Ethical behavior is an expectation for a professional. During your time at Murray State, you are a professional student and you will be expected to act ethically in regards to your academic pursuits. Should you chose to act in a manner that is not consistent with the academic honesty policy, just as in your professional career, you will face the consequences.

Those consequences may include:

Having the students involved in academic dishonesty repeat the assignment or do an additional related assignment for grading.

Lowering the grade for the assignment of any students involved in academic dishonesty.

Lowering the overall course grade of any students involved in academic dishonesty.

From the Murray State University Policy on Academic Honesty, we can find that:

“If the disciplinary action results in the awarding of a grade of E in the course, the student(s) may not drop the course.”

The MSU policy also allows the faculty to invalidate an entire assignment if they believe that the integrity of the assignment has been compromised. So not only could you adversely affect your own grade by dishonesty, but you could negate your classmate’s hard work.

In each course you may have additional items of academic honesty that the faculty member will address specifically in their syllabus.

Attendance

The surest way to lose your job is to miss work or show up late. The surest way to earn a higher course grade is to always attend class and be on time.

Attendance

Hundreds of web pages address the importance of attending class. Skipping class is like going to a store, dropping $50 on the counter, and walking out. Someone, maybe you, is paying a substantial amount of money for your education. If you can't be bothered to come to class, apparently, you might not want to be bothered by showing up for work.

Because of the way grading systems are set up, some students are able to miss class and still do well enough on exams and assignments to make a decent grade. College courses are more than exams and assignments. Interaction with the faculty and other students, discussion, solving problems as a group, and hands on practice are vital components of most courses.

The bottom line is that regardless of final grade, students who skip class have not learned what they should have learned or developed the work ethic to be ready for a career.

Although specific policies vary as to how grades are affected by class attendance, faculty expect regular attendance. Excused absences allow students the opportunity to make up work, but students are responsible for contacting the teacher. Students are still responsible for everything that was missed regardless of reason.

Tardiness

Showing up late for a class is rude and disruptive to the teacher and the other students. Some teachers will lock the door when class begins. Some teachers may call roll and count being late as a class absence.

Being late implies having a poor attitude and a poor work ethic. Potential employers are always interested in learning about the attendance habits of people whom they are considering hiring.

Good attendance and promptness generally leads to better grades and more favorable recommendations.

Calculations

In the professional world, you may need to go back to your calculations years after you have done the work to settle a dispute or solve an operational problem. You must have enough information in the calculations to document and remember what you did. Calculations for homework problems, lab reports, and projects should be prepared as follows:

1. Neat, orderly, and legibly printed.

2. Title blocks completed with assignment number, date, and name.

3. Presented on engineering paper or MSU Engineering Technology paper. If using software, the calculations still need to be summarized.

4. List applicable information

Problem Statement - What you are given and what you are trying to find

Format

Given: Summarize what you know, paraphrase the problem

Find: What answer are you seeking? (**including the units**)

Solution: (**including assumptions, formulas with elements defined**).

5. Show each step of the solution clearly. **Show all units and conversions**.

6. Answers underlined or in boxes and accompanied by applicable concluding remarks.

7. Computer printouts (spreadsheets, graphs) attached with results highlighted

8. Check your work. Calculation checks include the following:
   a. Validity of calculation logic, reasoning, assumptions
   b. Mathematical accuracy
   c. Reasonableness of results and conclusions

Grading

Accuracy	50%
Format	20%
Units	20%
Precision	5%
Highlights	5%

Power Point Use in Presentations

(Taken from an article by Dave Yearwood, University of North Dakota, Sept., 2009)

Purposes

Gain and hold the attention of your audience

Provide information that adds to existing knowledge

Challenge people to think more deeply

Suggestions

Relevant and quality clip art only

Conservative colors, slide design, graphics

Avoid crowding the slides with text or images

Replace or limit the amount of text

Concentrate on 3 or 4 main points for the entire presentation

Limit the number of slides (less is more, especially for text and graphs)

Use images that relate directly to text

Use the slides to stimulate discussion

Other Considerations (in addition to the article)

Do not read the slides word for word

Face the audience most of the time

Use the slides to tell a story

Use light letters on a dark background

Sans fonts, e.g. Sans Serif, are more pleasing to the reader

Speak to the back of the room

Check spelling

Use bulleted phrases rather than complete sentences or paragraphs

Never have more that 6 to 8 lines of text on a slide

If you need to show a paragraph, highlight the major points

Grading

Content	30%
Verbal Quality	30%
Slide Quality	30%
Discussion	10%

Article Review Format

"Why would we need to review (read) an article, case study or book? We won't do this when we are working after we graduate." This is a question and statement that most students will make in a class when they are assigned the task of reading an article and writing a review on what they have read. This simple answer to the question is: to make you **Industry Ready**.

The reality is that most of your education begins after graduation. One way that you will stay up on the latest technologies, trends, and developments is by reading articles, journals, books, and case studies (gaining Knowledge). In some instances you will want to convey this information on to other co-workers, supervisors, clients, regulators, or students. The way you convey this information is through communication. One form of communication that is extensively used is written communication.

Writing article reviews will help you improve your written communication. This document will give you the basics on how to develop an article review. It is up to you to practice it.

The following list of questions will help guide you through the process of analyzing the text that you have read. Read the entire article before answering the following questions. Consider all the questions when analyzing the text.

Purpose/Context

What is the article about? In other words, what is the article trying to explain or discuss? What overall purpose does the article serve? For example, is it meant to answer a question, propose a new idea or concept, summarize research findings, or does it have some other purpose? Why did they write this article?

Authors

Who wrote the article? Are the authors qualifications provided?

Audience

Where did the article come from (journal, magazine, website, etc.)? Who are the authors writing this article to (contractors, engineers, teachers, students, etc.)? What led you to the conclusion to whom the article was written?

Topic and Position

Is the opinion of the author made clear in the article or is the article presented as "objective"? Does the article deal with current events, past experiences, and/or review of research?

Research/Sources

What sources or research did the author base the article on? Did the author directly mention other articles, books or research? Does the author provide data or results?

Drawing Conclusions

Review your answers to the above questions. The answer the following questions.

What is your personal response to the article?
How does it apply to this course?
Why you chose this particular article?
Did you like the article?
Do you have any criticisms or questions?

I. ARTICLE REVIEW REPORT FORMAT

1. This method of reviewing and writing about an article can also be applied to case studies and book reviews.

2. All reports shall be in APA format. The following link is a very useful resource https://owl.english.purdue.edu/owl/resource/560/01/

3. All reports shall be written in third person unless you are required to provide your opinion on the subject matter. The following link is a useful resource: http://learners.ncu.edu/writingprogram/writing_center.aspx?menu_id=138

4. Your report should be typed, double-spaced on standard-sized paper (8.5" x 11") with 1" margins on all sides. You should use a clear font that is highly readable. APA recommends using 12 pt. Times New Roman font. The paper shall be ½ page to 2 pages in length or as directed by the Instructor.

5. Include a page header (also known as the "running head") at the top of every page. To create a page header/running head, insert page numbers flush right. Then type "LAST NAME COARSE NUMBER CASE STUDY #" in the header flush left using all capital letters. The running head is a shortened version of your paper's title and cannot exceed 50 characters including spacing and punctuation.

RUBRIC FOR ASSESSING ARTICLE REVIEW PAPERS

	Beginning or incomplete	Developing	Accomplished	Exemplary	Score
Introduction	Very little background information provided or information is incorrect **Points: 0-2**	Some information about the paper, but still missing some major points **Points: 3-5**	Introduction section is nearly complete, missing some minor points **Points: 6-8**	Introduction section is complete and well-written; provides all necessary background information **Points: 9-10**	
Body of Report	Missing several important details or points of the article **Points: 0-2**	Missing some important details **Points: 3-5**	Main details are covered, some minor details missing **Points: 6-8**	Well-written, all major and minor details are covered **Points: 9-10**	
Conclusions	Conclusions missing or missing the important points **Points: 0-2**	Conclusions regarding major points are drawn, but many are misstated, indicating a lack of understanding **Points: 3-5**	All important conclusions have been drawn, could be better stated **Points: 6-8**	All important conclusions have been clearly made, student shows good understanding **Points: 9-10**	
Spelling, grammar, sentence structure	Frequent grammar and/or spelling errors, writing style is rough and immature **Points: 0-2**	Occasional grammar/spelling errors, generally readable with some rough spots in writing style **Points: 3-5**	Less than 3 grammar/spelling errors, mature, readable style **Points: 6-8**	All grammar/spelling correct and very well-written **Points: 9-10**	
Appearance and formatting	Sections out of order, too much handwritten copy, sloppy formatting **Points: 0-2**	Sections in order, contains the minimum allowable amount of handwritten copy, formatting is rough but readable **Points: 3-5**	All sections in order, formatting generally good but could still be improved **Points: 6-8**	All sections in order, well-formatted, very readable **Points: 9-10**	

Title of Article Review

The first paragraph should be the introduction for your paper. The introduction provides a first glimpse of the article and what you will be presenting on. Make sure the introduction is well written so that it grabs the reader's attention.

This is where you will write the body of the text for discussing the article. Follow all the requirements listed in the format guide. Make sure to have the correct margins, font style, font size and line spacing. Write the paper in your own words do not copy directly from the case study paper.

Lab Report Format

II. LAB REPORT FORMAT

1. All lab reports shall be in APA format. The following link is a very useful resource https://owl.english.purdue.edu/owl/resource/560/01/

2. All lab reports shall be written in third person. The following link is a useful resource: http://learners.ncu.edu/writingprogram/writing_center.aspx?menu_id=138

3. Your lab report should be typed, double-spaced on standard-sized paper (8.5" x 11") with 1" margins on all sides. You should use a clear font that is highly readable. APA recommends using 12 pt. Times New Roman font.

4. Include a page header (also known as the "running head") at the top of every page. To create a page header/running head, insert page numbers flush right. Then type "LAST NAME COURSE NUMBER LAB #" in the header flush left using all capital letters. The running head is a shortened version of your paper's title and cannot exceed 50 characters including spacing and punctuation.

5. The lab report will have a title page, main body and references. All are on different sheets of paper.

6. The main body of the lab report will have five (5) main sections: Objective, Procedure, Data, Analysis, Conclusion

7. **Cover Page**
   i. The title page should contain the title of the lab paper, the author's name, and the date. Include the page header (described above) flush left with the page number flush right at the top of the page. Please note that on the title page, your page header/running head should look like this:

      Running head: TITLE OF YOUR PAPER

      Pages after the title page should have a running head that looks like this:

      TITLE OF YOUR PAPER

      Type your title in upper and lowercase letters centered in the upper half of the page. Class Course Number and Lab Number should be on the first line of title. The second line of title should contain the name of the lab performed. All text on the title page, and throughout your paper, should be double-spaced.

      Beneath the title, type the author's name: first name, middle initial(s), and last name. Do not use titles (Dr.) or degrees (PhD).

      Beneath the author's name, type the date that the lab was performed.

Use the attached sample report title page to see how your title page should look like. The start of the title will start approximately 2 ¼" down from the top of the page.

8. **Objective** (1 to 2 paragraphs)
    i. Briefly describe the purpose of the tests or experiment performed.

9. **Procedure**(1/2 to 3 pages)
    i. Include a description of (A) the materials tested, if appropriate, and (B) the major pieces of equipment and laboratory procedures used in each test. If a standard test method is used, the reference for the test (such as the ASTM designation) should be given. A brief description of the lab procedures used should be given for all cases. Describe in your own Use diagrams to illustrate.

10. **Data** (1/2 to 2 pages)
    i. Test results are to be summarized in tabular and/or graphical forms using your own charts or those provided. Main findings and conclusions are to be summarized and included in this section.

11. **Analysis** (1/2 to 2 pages)
    i. Discuss the salient facts as seen from the test results. Describe the problems that might be encountered during the lab. If the measured data seem to be in error, explain the possible causes of the problem. Try to relate the values you found in the lab with those that appear in the literature. Finally, briefly describe what you have learned from this lab.

12. **Conclusions**
    i. Summarize findings and interpret what you believe the results provide.
13. **References**
    i. List all references used during the lab or during the writing of the lab report. Include any standard used (ASTM, ANSI, IEEE, etc.).

RUBRIC FOR ASSESSING LAB REPORTS

	Beginning or incomplete	Developing	Accomplished	Exemplary	Score
Cover Page	No cover page. **Points: 0**	Cover page is missing a majority of the data or major formatting issues. **Points: 1-2**	Cover page is missing only minor data and only minor formatting issues. **Points: 3-4**	Cover page is complete with title, author, data, and other required data. **Points: 5**	
Objective	Very little background information provided or information is incorrect **Points: 0-2**	Some information about the objective of the lab, but still missing some major points **Points: 3-5**	Objective section is nearly complete, missing some minor points **Points: 6-8**	Objective section is complete and well-written; provides all necessary background principles for the experiment **Points: 9-10**	
Procedure	Missing several important experimental details or not written in paragraph format **Points: 0-2**	Written in paragraph format, still missing some important experimental details **Points: 3-5**	Written in paragraph format, important experimental details are covered, some minor details missing **Points: 6-8**	Well-written in paragraph format, all experimental details are covered **Points: 9-10**	
Data	Figures, graphs, tables contain errors or are poorly constructed, have missing titles, captions or numbers, units missing or incorrect, etc. **Points: 0-2**	Most figures, graphs, tables OK, some still missing some important or required features **Points: 3-8**	All figures, graphs, tables are correctly drawn, but some have minor problems or could still be improved **Points: 9-14**	All figures, graphs, tables are correctly drawn, are numbered and contain titles/captions. **Points: 15-20**	
Analysis	Very incomplete or incorrect interpretation of trends and comparison of data indicating a lack of understanding of results **Points: 0-2**	Some of the results have been correctly interpreted and discussed; partial but incomplete understanding of results is still evident **Points: 3-5**	Almost all of the results have been correctly interpreted and discussed, only minor improvements are needed **Points: 6-8**	All important trends and data comparisons have been interpreted correctly and discussed, good understanding of results is conveyed **Points: 9-10**	

Conclusions	Conclusions missing or missing the important points **Points: 0-2**	Conclusions regarding major points are drawn, but many are misstated, indicating a lack of understanding **Points: 3-5**	All important conclusions have been drawn, could be better stated **Points: 6-8**	All important conclusions have been clearly made, student shows good understanding **Points: 9-10**	
References	No references listed. **Points: 0-2**	At least one reference listed but missing a majority of the references. Incorrect formatting of references. **Points: 3-5**	At least one reference listed but missing only one reference. Majority of the formatting is correct. **Points: 6-8**	All references listed and formatted correctly. **Points: 9-10**	
Lab Sheet	Lab sheet is not attached lab report. **Points: 0-2**	Lab sheet is missing a majority of the data. Sloppy handwriting or illegible. **Points: 3-5**	Lab sheet is only missing minor data. Handwriting is legible. **Points: 6-8**	Lab sheet is completely filled out and handwriting is legible. **Points: 9-10**	
Spelling, grammar, sentence structure	Frequent grammar and/or spelling errors, writing style is rough and immature **Points: 0-2**	Occasional grammar/spelling errors, generally readable with some rough spots in writing style **Points: 3-5**	Less than 3 grammar/spelling errors, mature, readable style **Points: 6-8**	All grammar/spelling correct and very well-written **Points: 9-10**	
Appearance and formatting	Sections out of order, too much handwritten copy, sloppy formatting **Points: 0-2**	Sections in order, contains the minimum allowable amount of handwritten copy, formatting is rough but readable **Points: 3-5**	All sections in order, formatting generally good but could still be improved **Points: 6-8**	All sections in order, well-formatted, very readable **Points: 9-10**	

EMT 262-01 Lab 1

Power Unit Startup Procedure

Jake Hildebrant

09/02/13

Objective

The purpose of this laboratory is to familiarize the student with the hydraulic trainer units.

Procedure

- Check trainer power cord and if unplugged connect unit to proper power receptacle.
- Open relief valve fully open by turning clockwise (looking down) until indicator is fully extended.
- Open dump valve (shutoff valve) by turning yellow handle parallel with flow direction. Valve is closed when the yellow handle is perpendicular to the flow direction.
- Make sure no fluid circuit is connected to the flow (pressure) manifold.
- Turn pump on by pressing the green start button on the start/stop electrical box.
- Slowly close the dump valve while watching the supply pressure gage making sure that no pressure is detected as you fully close the valve. If pressure is detected quickly open valve and check pressure relief valve to verify it is fully open. If relief valve is open stop procedure at this point until power unit can be checked out.
- With the dump valve closed, turn relief valve counter clockwise, closing it until pressure begins to register on the supply pressure gage. Slowly continue closing the relief valve until the supply pressure gage reads 500 psig.
- Open the dump valve and turn pump off by pressing the red stop button on the start/stop electrical box

Equipment: Hydraulic Trainer Capital Asset Number 74565

Data

No data taken in laboratory #1

Analysis

The power unit circuit schematic is shown in figure 1. The circuit is safely setup by opening both the pressure relief valve and the dump valve so that when the positive displacement pump is turned on the flow has two low resistance paths by which to return to the reservoir tank. The flow manifold, which is labeled pressure, should be in reality labeled flow. The reason is that positive displacement pumps actually are flow machines and that the system pressure is a result of the hydraulic system that is connected to it.

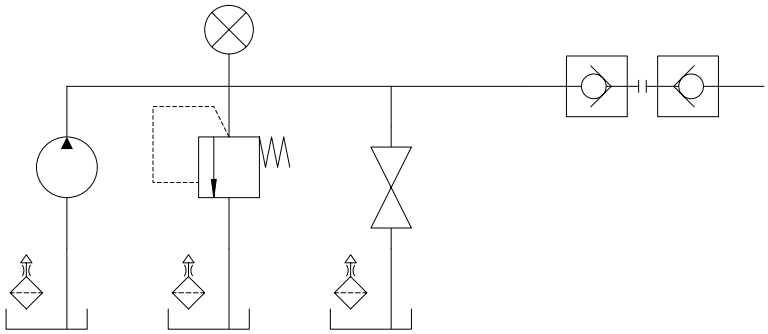

Figure 1. Power Unit Schematic

Once the dump valve has been closed the only flow path is then through the pressure relieving valve. The relief valve is set to the maximum pressure allowed in the system. The power unit is now ready to connect a fluid power circuit to the quick connect manifold for testing. As long as the pressure induced by the fluid power circuit operation is below the relief valve pressure setting all the pump flow will go to the attached fluid power circuit. If at anytime the system pressure gets at or above the relief valve setting some flow will then bleed down the relief valve path and reduce flow to the system.

Conclusion

The above procedure assures that the hydraulic power unit is safely setup for use in testing various hydraulic circuit and components. The National Fluid Power Association (NFPA) confirms the importance of fluid power in industry by stating that “the fluid power industry is growing at astonishing rates” (NFPA, 2013). The power unit trainers in the Murray State University Electromechanical laboratory helps students attain the knowledge needed to help advance this technology in industry.

Reference

NFPA. (2013). *What is fluid power?* Retrieved August 15, 2013 from: http://www.nfpa.com/fluidpower/whatisfluidpower.aspx

Technical Report Format

One question that always comes up, from students, is “Why do we have to write technical reports?” The simple answer is: to make you **Industry Ready**. Communication is one of the four areas that every student needs to work on to make the Industry Ready. Communication can be verbal or written. Written communication is an essential skill that requires constant practice to make improvements (i.e. practice makes perfect). This document will give you the basics on how to develop a technical report. It is up to you to practice it.

Technical reports are written every day by architects, engineers, project managers, and construction inspectors. These reports are submitted to the owner/client, state and federal agencies, planning commissions, and to other engineers and architects.

The following text is taken from Colorado State University’s website. It is a great explanation of engineering technical reports:

Technical reports include various types of "technical" information. For example, if you need to report why a design or piece of equipment failed, you'd write a forensic report. Or, you might have to write about a design you created. Then, you'd produce a design report or, you may need to combine these two. Many report types are classified as technical reports. You should always determine what information you need to convey and who your audience is before you start writing.

Technical reports present facts and conclusions about your designs and other projects. Typically, a technical report includes research about technical concepts as well as graphical depictions of designs and data. A technical report also follows a strict organization. This way, when other engineers read what you write, they can quickly locate the information that interests them the most.

As a student, you might assume that your technical report's audience is your instructor; however, this may not always be the case. Your instructor may ask you to produce a report for your peers or for other engineers. However, you shouldn't always assume that your audience has a strong engineering background or is familiar with the engineering terminology you use. Always check with your instructor to know who your audience is.

As an engineer in the field, the most likely audience for the technical reports you produce is other engineers with a background similar to yours. This audience is more likely to understand the terminology you use. However, you should always evaluate who your readers will be before assuming they will understand your jargon. Consider how your readers will use your report. For instance, you might submit a technical report to a publication or your technical report may present a specific design. The audiences in each situation have different needs. Audiences may read the publication for information and insight while audiences reading about your specific design may critique your design or make decisions based on its content.

III. ENGINEERING TECHNICAL REPORT FORMAT

1. All reports shall be in APA format. The following link is a useful resource https://owl.english.purdue.edu/owl/resource/560/01/

2. All reports shall be written in third person. The following link is a useful resource: http://learners.ncu.edu/writingprogram/writing_center.aspx?menu_id=138

3. Your report should be typed, double-spaced on standard-sized paper (8.5" x 11") with 1" margins on all sides. You should use a clear font that is highly readable. APA recommends using 12 pt. Times New Roman font.

4. Include a page header (also known as the "running head") at the top of every page. To create a page header/running head, insert page numbers flush right. Then type "LAST NAME COURSE NUMBER LAB #" in the header flush left using all capital letters. The running head is a shortened version of your paper's title and cannot exceed 50 characters including spacing and punctuation.

5. The report will have a title page, main body and references. All are on different sheets of paper.

6. The main body of the report will have the following sections: Introduction, various sections depending on the topic, and Conclusion. The report should be written so that the reader is seamlessly lead through the material. By the time reader reaches the end of the report they will be able to draw the same conclusions as you. Make sure the report flows from section to section.

7. **Transmittal Letter**

    i. The engineering technical report shall be accompanied by a transmittal letter (unless otherwise specified by the Instructor).
    ii. The letter shall be addressed to the recipient of the report.
    iii. The body of the letter should explain what is being transmitted and why.
    iv. The letter shall be signed.

8. **Cover Page**

    i. The title page should contain the title of the lab paper, the author's name, and the date. Include the page header (described above) flush left with the page number flush right at the top of the page. Please note that on the title page, your page header/running head should look like this:

    Running head: TITLE OF YOUR PAPER

    Pages after the title page should have a running head that looks like this: TITLE OF YOUR PAPER

    Beneath the title, type the author's name: first name, middle initial(s), and last name. Do not use titles (Dr.) or degrees (PhD).

Beneath the author's name, type the date that the report was completed.

Use the attached sample report title page to see how your title page should look like. The start of the title will start approximately 2 ¼" down from the top of the page.

9. **Introduction** (1 to 2 paragraphs)
    i. Briefly describe/introduce the subject matter of the report. The introduction should pull the readers in and prepare them for the rest of the report.

10. **Various Sections** (1/2 to 5 pages)
    i. The number of sections required will depend on the subject matter.
    ii. Figures and diagrams may be included in the body of the text (see the attached example).
    iii. Each section should lead from one to the next.
    iv. Discuss the salient facts. Describe the problems that might be encountered.

11. **Conclusions**
    i. Summarize findings and interpret what you believe the results provide.

12. **Graphs/Table/Output**
    i. If your report will require the inclusion of graphs, tables, and/or computer output; they shall be included in the report after the Conclusion section.
    ii. Each table, graph, or computer output shall be on a separate piece of paper.
    iii. Each table or graph shall have a title.
    iv. Each page will have the same running header as the main body of the document.

13. **References**
    i. List all references used during the lab or during the writing of the lab report. Include any standard used (ASTM, ANSI, IEEE, etc.).

RUBRIC FOR ASSESSING LAB REPORTS

	Beginning or incomplete	Developing	Accomplished	Exemplary	Score
Transmittal Letter	No transmittal letter. **Points: 0**	Transmittal letter has a majority of the information or major formatting issues. **Points: 3-5**	Transmittal letter is missing only minor information and only minor formatting issues. **Points: 6-8**	Transmittal Letter is complete with signature. **Points: 9-10**	
Cover Page	No cover page. **Points: 0**	Cover page is missing a majority of the data or major formatting issues. **Points: 1-2**	Cover page is missing only minor data and only minor formatting issues. **Points: 3-4**	Cover page is complete with title, author, data, and other required data. **Points: 5**	
Introduction	Very little background information provided or information is incorrect **Points: 0-2**	Some information about the objective of the report, but still missing some major points **Points: 3-5**	Objective section is nearly complete, missing some minor points **Points: 6-8**	Objective section is complete and well-written; provides all necessary background principles for the experiment **Points: 9-10**	
Sections	Missing several important details or not written in paragraph format **Points: 0-2**	Written in paragraph format, still missing some important details **Points: 3-8**	Written in paragraph format, important details are covered, some minor details missing **Points: 9-14**	Well-written in paragraph format, all details are covered **Points: 15-20**	
Figures/Graphs /Tables	Figures, graphs, tables contain errors or are poorly constructed, have missing titles, captions or numbers, units missing or incorrect, etc. **Points: 0-2**	Most figures, graphs, tables OK, some still missing some important or required features **Points: 3-5**	All figures, graphs, tables are correctly drawn, but some have minor problems or could still be improved **Points: 6-8**	All figures, graphs, tables are correctly drawn, are numbered and contain titles/captions. **Points: 9-10**	
Conclusions	Conclusions missing or missing the important points **Points: 0-2**	Conclusions regarding major points are drawn, but many are misstated, indicating a lack of understanding **Points: 3-5**	All important conclusions have been drawn, could be better stated **Points: 6-8**	All important conclusions have been clearly made, student shows good understanding **Points: 9-10**	

References	No references listed. **Points: 0-2**	At least one reference listed but missing a majority of the references. Incorrect formatting of references. **Points: 3-5**	At least one reference listed but missing only one reference. Majority of the formatting is correct. **Points: 6-8**	All references listed and formatted correctly. **Points: 9-10**	
Spelling, grammar, sentence structure	Frequent grammar and/or spelling errors, writing style is rough and immature **Points: 0-2**	Occasional grammar/spelling errors, generally readable with some rough spots in writing style **Points: 3-7**	Less than 3 grammar/spelling errors, mature, readable style **Points: 8-11**	All grammar/spelling correct and very well-written **Points: 12-15**	
Appearance and formatting	Sections out of order, too much handwritten copy, sloppy formatting **Points: 0-2**	Sections in order, contains the minimum allowable amount of handwritten copy, formatting is rough but readable **Points: 3-5**	All sections in order, formatting generally good but could still be improved **Points: 6-8**	All sections in order, well-formatted, very readable **Points: 9-10**	

May 1, 2014

Dr. Ozzy Osborne
Hard Rock University
Los Angeles, California 08125

RE: Negative Effects of Loud Noise

Dear Dr. Osborne:

We are submitting to you the report, due May 1, 2014, that you requested. The report is entitled The Negative Effects of Loud Noise. The purpose of the report is to inform you of our research on the negative effects that loud noise has on human hearing. The report contains detailed information on short term and long term effects.

We hope that you find the information in this report to be beneficial to your project.

Let us know if we can be of any further assistance.

Sincerely,

Kermit Frog

EMT 262-01 Lab 1

Power Unit Startup Procedure

Jake Hildebrant

09/02/19

Objective

The purpose of this laboratory is to familiarize the student with the hydraulic trainer units.

Procedure

- Check trainer power cord and if unplugged connect unit to proper power receptacle.
- Open relief valve fully open by turning clockwise (looking down) until indicator is fully extended.
- Open dump valve (shutoff valve) by turning yellow handle parallel with flow direction. Valve is closed when the yellow handle is perpendicular to the flow direction.
- Make sure no fluid circuit is connected to the flow (pressure) manifold.
- Turn pump on by pressing the green start button on the start/stop electrical box.
- Slowly close the dump valve while watching the supply pressure gage making sure that no pressure is detected as you fully close the valve. If pressure is detected quickly open valve and check pressure relief valve to verify it is fully open. If relief valve is open stop procedure at this point until power unit can be checked out.
- With the dump valve closed, turn relief valve counter clockwise, closing it until pressure begins to register on the supply pressure gage. Slowly continue closing the relief valve until the supply pressure gage reads 500 psig.
- Open the dump valve and turn pump off by pressing the red stop button on the start/stop electrical box

Equipment: Hydraulic Trainer Capital Asset Number 74565

Data

No data taken in laboratory #1

Analysis

The power unit circuit schematic is shown in figure 1. The circuit is safely setup by opening both the pressure relief valve and the dump valve so that when the positive displacement pump is

turned on the flow has two low resistance paths by which to return to the reservoir tank. The flow manifold, which is labeled pressure, should be in reality labeled flow. The reason is that positive displacement pumps actually are flow machines and that the system pressure is a result of the hydraulic system that is connected to it.

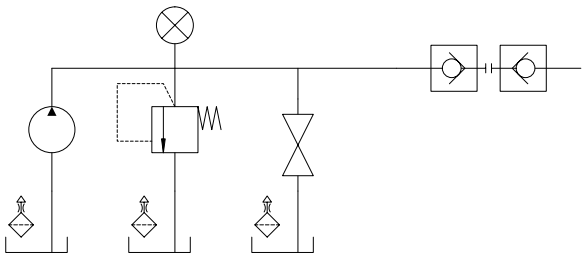

Figure 1. Power Unit Schematic

Once the dump valve has been closed the only flow path is then through the pressure relieving valve. The relief valve is set to the maximum pressure allowed in the system. The power unit is now ready to connect a fluid power circuit to the quick connect manifold for testing. As long as the pressure induced by the fluid power circuit operation is below the relief valve pressure setting all the pump flow will go to the attached fluid power circuit. If at anytime the system pressure gets at or above the relief valve setting some flow will then bleed down the relief valve path and reduce flow to the system.

Conclusion

The above procedure assures that the hydraulic power unit is safely setup for use in testing various hydraulic circuit and components. The National Fluid Power Association (NFPA) confirms the importance of fluid power in industry by stating that “the fluid power industry is growing at astonishing rates” (NFPA, 2013). The power unit trainers in the Murray State University Electromechanical laboratory helps students attain the knowledge needed to help advance this technology in industry.

Reference

NFPA. (2013). *What is fluid power?* Retrieved August 15, 2013 from: http://www.nfpa.com/fluidpower/whatisfluidpower.aspx

Letters of Recommendation

In each of the paths of study that students within are department take, there are two major components to becoming ***INDUSTRY READY*** – formal education and work experience.

You will address the formal education component during your class time at Murray State. Your instructors and professors will do their very best to provide you with opportunities to obtain a solid education during your course work. Our goal is to impart knowledge to you by showing how each class applies to your future work goals.

When the time comes to gain work experience in the form of an internship or full-time employment in your chosen field, you will likely want to use one or more of the faculty members as a reference. A reference may take the form of a letter of reference, letter of introduction, or simply listing the faculty member on a sheet of references submitted to a potential employer.

In our department, there is a great deal of hard work and effort put into creating a good relationship with potential employers. We have continued success with student placement based on the well prepared, educated, and ***INDUSTRY READY*** students we send to these employers. There is a level of trust and expectation established between Murray State and our industry partners. We can safely rely on our industry contacts to fill in the formal education received at Murray State with the valuable work experience that will make you a well-rounded professional. Our industry partners can expect an intern or employee who will be knowledgeable, responsible, eager to grow, and an asset to their company.

If you would like to use a faculty member as a reference, it would be polite to first ask that faculty member if you may do so. Providing a reference for someone is not a matter that should be taken lightly. When a professor vouches for your abilities to a potential employer, the instructor's reputation is also involved in your success. When one of your teachers at Murray State provides a reference for you, it is to be understood that there is an expectation that you will put forth an outstanding effort in your career.

As you move through your college career, keep in mind what level of reference your instructors will be able to honestly provide for you. In the future when you ask for a reference from one of your professors, which of the following statements would you prefer?

1. "He/she showed up for class a majority of the time and turned in satisfactory work. He/she rarely asked any questions and managed to get through my courses with acceptable work." Or
2. "He/she was an outstanding student who was at every class meeting. He/she actively sought clarification if a concept was not clear. He/she participated in student clubs pertaining to their chosen profession and often took on extra projects just to gain additional experience and knowledge pertaining to their course of study. I have personally watched this student grow into someone who is ***INDUSTRY READY***. I see this student as a great asset for your company and someone who will grow into a leader in our profession."

Now is the time to develop the reputation for excellence that will place you as a leader in your field. You do not have to be a 4.0 student to earn a solid recommendation. You simply need to apply yourself. Put forth effort in your classes, in your professional community, and in your personal growth. Take responsibility and ownership of your own success. The measure of your effort can be seen in the quality of your assignments and projects that you submit in your classes. Make each one count.