

**TECH 646 Analysis of Research in Industry & Technology**  
**Assignment 5**  
**Research Project Proposal**

**Assigned date:** Friday, September 21, 2018

**Due date:** Thursday, Sept. 27, 2018, before 5 PM

**Hand-in requirement (Each student submit):**

- A MS Word file: research questions and hypotheses, and related references.
- A MS PowerPoint file: 10 minutes briefing and presentation

The main purposed of this assignment include

- Reinforce your knowledge about the fundamental concepts of research and process,
- Get you start thinking about the multidiscipline research project you will undertake throughout the course, and
- Reshape your Research Project Proposal with similar outline like Exhibit 5-10

This assignment requires that your team to continue on the initial investigation of the two proposed research projects:

(A) Improving the Accuracy and Quality of Metal Bar Straightening Process,

(B) Measuring and Maintaining the Concentration Ratio of a Water-Soluble Process Coolant

For each research project being considered, the team would need to refine and/or add

- a) Problem Statement
- b) "Introduction" section that use the collect secondary data and information in
  - Current operating status/process/environment
  - Desired improvements
  - Be sure to give all pictures with needed illustration such as
    - Figure 1. Rotary Straightening Machine
    - Figure 2. Rotary Arbor with 5 Adjusting Hex Screws
    - etc
  - A literature reviews (expert interviews, historical data, trade magazine, scholarly journal/transactions, etc) on the available recommended solutions, pros/cons
- c) Identify all concepts and constructs, their operational definitions, IV, DV, etc
- d) Give and/or refine research questions
  - Be sure to include all references that you used directly to complete the assignment.
- e) Proposed solutions and benefits
- f) Create a research project plan (Research Design Project Planning) that containing
  - Major tasks
    - Subtasks, budget time, who is responsible for the tasks
  - Milestones
    - 
    - Proposal review and approval
    - ...
    - Final report
    - Project presentation and acceptance

Note:

1. Be sure to document the used reference, the searched resources, publications, and papers, or articles, using IEEE Reference format as shown in the following link:  
[http://www.etcs.pfw.edu/~lin/ECET491/FinalReportRelated/FinalReport\\_GuideLineS2017.pdf](http://www.etcs.pfw.edu/~lin/ECET491/FinalReportRelated/FinalReport_GuideLineS2017.pdf)
2. Prepare a MS PowerPoint slide (about 10 minutes) to present your finding.
3. Conduct your search using key terms: Refractometer, water soluble coolants, measuring coolant concentration, coolant management, etc

## References

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- [ 2 ] Reduction and Treatment Options for Water Soluble Coolants, Laura Newcombe, 1986 Summer Intern Report, <http://infohouse.p2ric.org/ref/21/20258.pdf>
- [ 3 ] Types of Machine Coolants, <http://www.carbideprocessors.com/pages/machine-coolant/types-of-machine-coolant.html>
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- [ 10 ] Measuring the coolant concentration – Rhenus Lub, [https://www.rhenuslub.de/wp-content/uploads/rhenuslub\\_2018-02\\_impuls\\_coolant-concentration.pdf](https://www.rhenuslub.de/wp-content/uploads/rhenuslub_2018-02_impuls_coolant-concentration.pdf)
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- [ 12 ] Concentration Measurement- technical Report, <http://www.cimcool.com/wp-content/uploads/tech-reports/newconc.pdf>
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- [ 16 ] A Multi-Objective Approach for Wire-Drawing Process, by L. Filice, G. Ambrogio, F. Guerriero, ScienceDirect Elsevier, 8<sup>th</sup> CIRP Conference on Intelligent Computation in Manufacturing Engineering, <https://core.ac.uk/download/pdf/82631120.pdf>