

## CEMM 521 Environmental Microbiology Critical Review Paper FALL 2006

### I) Paper

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This class will have a term paper review requirement. The format of the paper will be a **medium length (10-15 pages text)** critical review of three (**3**) journal articles from the **very recent (2002 or later)** scholarly literature. **If you select an older article you will get a 10% reduction in grade!** The selection of the papers should be **very coherent**, with the three articles representing related papers on the same topic, or a progression of papers developing the same topic.

- The critical review should have four parts: an **1) introduction**, **2) state the purposes, aims, methods, and results** of each paper (without pulling text from the article), close with a **3) summary** and a **4) conclusion**.
- **It MUST be in your own words.** Do not simply use verbatim restatements of the articles. This is skirting the edge of plagiarism, is **not acceptable, and will result in a grade of zero for the paper.** A direct quotation to highlight a point is OK, but must not be the basis of your review. Direct quotes must be in notation.
- The review should close with a succinct **summary** (~1 page) and a **conclusions** statement (**at least 2 pages**) based upon your review of the articles in light of what you have learned in this class. Questions that you need to address in your conclusion section include (**ALL FOUR MUST BE ADDRESSED, if not you get a zero on the paper**):
  - 1) Did the authors draw the appropriate conclusions from their results?
  - 2) Are the experimental procedures valid and up to date?
  - 3) What might the authors have done differently within the context of their study?
  - 4) What would you suggest as an avenue for further exploration?
- Only spend as much space as needed to succinctly get the main goals, results, and conclusions of each article (<1.5-2 pages for each article); as you only have 8-15 pages for introductory text, reviews, and summary/conclusions of the results.
- The paper will account for **30% of the final grade**.
- Selected papers **must be about research in the topics below.** You will give a brief presentation of the paper at the end of the semester. An **outline** of the paper with copies of the selected journal articles is **due to me by the lecture after the midquarter exam.** I will give back each outline with my remarks and suggestions.

**Topics MUST come from the following list**

- 1- Microbial ecology of wastewater treatment systems
- 2- Molecular, immuno or biosensor probes for species activity in the environment
- 3- Aromatic contaminant degradation
- 4- Anaerobic dechlorination of chlorinated solvents
- 5- Biotransformations of munitions
- 6- Biotransformations of polychlorinated biphenyls
- 7- Biotransformations of herbicides and/or pesticides
- 8- Biotransformations of metals and/or organo-metals
- 9- Bioavailability of hydrophobic contaminants to bacteria

**Notes on grading and acceptable citations**

You will find that I grade heavily on grammar. People will judge you on your writing style, and I will as well. With today's word processors, there is no excuse for misspellings and poor grammar. At the very least, you must perform a spell check and grammar check. Every semester I state these guidelines, and every semester I continue to receive reviews with misspellings. Therefore, to further emphasize the importance of proper spelling, I have the following rule:

**Misspelling words will result in a 10% grade reduction.**

Plagiarism is a violation of the student conduct code and will not be tolerated. All work that comes from another source must be cited properly. All ideas that are not your own or are not generally known should be cited. Go to the original source for the proper citation. Citing a paper that cites another paper is not acceptable. **CITING THE INTERNET AS A SOURCE IS NOT ACCEPTABLE.** WebPages are too ephemeral and tend to have extremely poor acknowledgement and citation of the ideas contained therein. Use of pictures and figures must be properly acknowledged. The use of figures from the Internet may be acceptable only if the figure is properly sourced (try to find the original source) and acknowledged. If in doubt, please see me.

Proper in text citation should use author-date format as in the following:

Researchers have reported that polycyclic aromatic hydrocarbons such as phenanthrene can be biodegraded under denitrifying (Rockne et al, 2000) and sulfate reducing conditions (Rockne and Strand, 1998).

Extensive citations of text should be indented (as in the statement above) in notation. Individual statements of fact should be in your words with the proper citations. Arrange the citations in alphabetical order at the end of the paper in a *references cited* section. You should use the following format (note indentations and spacing):

**Journal articles:**

Rockne, K. J., J. C. Chee-Sanford, R. A. Sanford, B. Hedlund, J. T. Staley, and S. E. Strand (2000) Anaerobic naphthalene degradation by microbial pure cultures

under nitrate-reducing conditions. *Applied Environmental Microbiology*. **66**(4):1595-1601.

Rockne, K. J. and S. E. Strand (1998) Biodegradation of bicyclic and polycyclic aromatic hydrocarbons in anaerobic enrichments. *Environmental Science and Technology*. **32**(24):3962-3967.

**Edited books:**

Olivier, J.P. and W.B. Conklin (1992) Determination of pore size distribution from density functional theoretic models of adsorption and condensation within porous solids. *In: The effects of surface heterogeneity in adsorption and catalysis on solids*. Einstein, A. and N. Bohr (Eds.). Prentice Hall, New York.

**Books and reports:**

Gregg, S.J. and S. W. Sing (1982) *Adsorption, surface area, and porosity*. Academic Press, London.

The journal name is italicized and volume number is bold for journal articles. The book name (either edited or not) is italicized. All authors must be identified (no et al). Personal communications and conference presentations (unless published in a proceeding) are not generally acceptable within the scope of this project, although they are suitable in many other instances.

**Potential journals for articles include but are not limited to:**

*Applied and Environmental Microbiology*

*Environmental Science and Technology*

*Water Research*

*Applied Microbiology and Biotechnology*

*Current opinion in Biotechnology*

*FEMS Microbiology Letters*

*Archives of Microbiology*

*Journal of Basic Microbiology*

*Science or Nature*

*Journal of Bacteriology*

*Environmental Engineering Journal (ASCE)*

*Bioremediation Journal*

*Water Science and Technology (formerly JWPCF)*

*Environmental Progress*

*Chemosphere*

*Microbial Ecology*

*Biochemistry*

*Biotechnology and Bioengineering*

*Soil Science*