THREE RIVERS COMMUNITY-TECHNICAL COLLEGE
COURSE OUTLINE

Course Number/Title: NUC 118 Nuclear Chemistry

Lecture 2 hrs Laboratory 0 hrs Credit 1 hrs Contact 1 hrs

Course Description: This course is an introduction to basic concepts associated with nuclear reactor chemistry. Topics covered include the detrimental effects of corrosion, acids/bases and ph, oxidation-reduction reactions, corrosion mechanisms, corrosion control, radio chemistry, and plant analyses.

Method: Lecture

Text: Handouts

Prerequisites: CHE K121, MAT K186, NUC K100 Co-Requisites: NUC K117

COURSE TOPICS/CONTENT

	HOURS
INTRODUCTION	3
1. Chemistry as it pertains to nuclear power plants	
2. Chemicals used in power plants	
3. Electrolytes and conductivity	
ACIDS AND BASES	3
1. Neutralization equations	
2. Complete and incomplete neutralization	
3. pH	
OXIDATION-REDUCTION	3
1. Basic redox reactions	
2. Lead-acid battery	
3. Nernst Equation	
PRINCIPLES OF CORROSION AND CORROSION PREVENTION	3
1. General corrosion	
2. Galvanic corrosion	
3. Stress corrosions	
4. Pitting corrosions	
5. Hydrides	
6. Zircaley crevice corrosion	
ASSOCIATED TOPIC IN REACTOR CHEMISTRY	3
1. Radionuclides in coolant	
2. Plant analysis	
3. Ion exchange	
TOTAL HOURS	15

Date: October 9, 2002

Prepared By: Nuclear Staff

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Department Chairperson: *Anthony Benoit*

Continuation Sheet No 2 of 2

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Measurable Objectives

The student will gain a good background in general inorganic chemical concepts. The student will become familiar with corrosion problems in power plants with an emphasis on how these problems can be minimized or prevented. Additionally, the development of plant analysis and their application to plant operational performance will be perfected as a diagnostic tool.