

## Hessen: ISU Course Outline

# Risk Management in Environmental Engineering Risk Control

CLASS HOURS: 20

### PROFESSOR (Academic Director)

Prof. Dr. Stephan Theobald

- Office: Kurt-Wolters-Straße 3; D-34125 Kassel - Office hours: by appointment
- Email: [s.theobald@uni-kassel.de](mailto:s.theobald@uni-kassel.de) - Phone: +49 561 804-2679

### Lecturer:

Bryan Beamer, PhD, PE, CSP

302 Jarvis Hall Science Wing

Email: [beamerb@uwstout.edu](mailto:beamerb@uwstout.edu)

ISU 2015: Elbert Sorrell, Ed.D., CSP

## 1) INFORMATION ON THE COURSE CONTENT

### COURSE DESCRIPTION and LEARNING OBJECTIVES

The course is focused on understanding and applying risk assessment and management techniques pertaining to: Worker Safety and Health; Environmental Safety; and the prevention and mitigation of potential accidents and emergencies. Students taking this class will be able to: identify hazards, assess their risk of these hazards; and define controls to eliminate and mitigate risks.

**References:**

- Bruce Main: *Risk Assessment Basics and Benchmarks* (2004)
- **Materials by Sverdrup Corporation:**
  - *Failure Modes and Effects Analysis*
  - *Preliminary Hazard Analysis*
  - *Risk Assessment Concepts*

All further material will be given during the course.

**TENTATIVE CLASS SCHEDULE**

Day	Topic	Assignment given	Assignment due
1	1. Overview 2. Making Presentations	Find an article and make a report about it	
2	1. See presentations - give a grade 2. Work on severity / probability interpretations	Group severity/probability interpretations	Synopsis of article Presentation
3	1. Severity/probability interpretations 2. Risk Assessment and Estimation techniques	Basic Risk Assessment	Severity/probability interpretations
4	Introduction to <i>Preliminary Hazard Analysis</i> presentations and group work	- <i>Preliminary Hazard Analysis</i> presentations -discussion of presentation skills	Risk matrix and a couple of examples
5	Effective communication of risk / risk mitigation to management	10 minute in-class writing assignment	<i>Preliminary Hazard Analysis</i> Report - group oral
6	1. Preliminary grading of writing assignment discussion about business writing 2. Presentations of other methods 3. <i>What if?- analysis</i> activity	Read <i>Failure Modes and Effects Analysis</i> materials	1. Writing assignment - a company and some hazards 2. presentations
7	1. Presentations of <i>HAZOP (hazard and operability study) Analysis</i> and <i>Fault Tree Analysis</i> 2. <i>Failure Modes and Effects Analysis</i> activity	Discussion of pros and cons of various analysis techniques.	1. presentations
8	1. Presentations of <i>HAZOP Analysis</i> and <i>Fault Tree Analysis</i>	Discussion of rough draft of written assignments.	1. presentations 2. written report of another analysis - why analysis works

	2. Talk about Work on rough drafts		and all about it.
9	1. Presentations of <i>HAZOP Analysis</i> and <i>Fault Tree Analysis</i> 2. Cost benefit analysis 3. Give final Project assignment	Final Project Assignment	1. presentations of other methods
10	Final Presentations and course summary. Course evaluations		Final Presentations / Reports due

## **2) INFORMATION ON CLASS PARTICIPATION, ASSIGNMENTS AND EXAMS**

### **ASSIGNMENTS**

- Active participation in discussions and presentations, independent study

### **EXAMS**

*30% - PHA presentations – group oral*

*30% - Final Report – written, individual*

*10% - In-class presentation of a non-PHA analysis – oral, individual*

*30% - Other homework and in-class assignments*

### **PROFESSIONALISM & CLASS PARTICIPATION**

- Regular attendance

### **MISSED CLASSES**

No more than 10% of the contact hours can be missed for successful completion of the class.

## **3) INFORMATION ON GRADING AND ECTS**

### **ACADEMIC STANDARDS**

Upon successful completion, 3 ECTS will be awarded for the class.

According to the rules of ECTS, one credit is equivalent to 25-30 hours student workload.

**GRADING SCALE:**

<i>Grade</i>		<i>Description</i>
<i>15 points</i>	<i>1.0</i>	<i>very good: an outstanding achievement</i>
<i>14 points</i>		
<i>13 points</i>	<i>1.3</i>	
<i>12 points</i>	<i>1.7</i>	<i>good: an achievement substantially above average requirements</i>
<i>11 points</i>	<i>2.0</i>	
<i>10 points</i>	<i>2.3</i>	
<i>9 points</i>	<i>2.7</i>	<i>satisfactory: an achievement which corresponds to average requirements</i>
<i>8 points</i>	<i>3.0</i>	
<i>7 points</i>	<i>3.3</i>	
<i>6 points</i>	<i>3.7</i>	<i>sufficient: an achievement which barely meets the requirements</i>
<i>5 points</i>	<i>4.0</i>	
<i>4 points</i>	<i>5.0</i>	<i>not sufficient / failed: an achievement which does not meet the requirements</i>
<i>3 points</i>		
<i>2 points</i>		
<i>1 point</i>		
<i>0 points</i>		

This course description was issued on: February 5, 2015. Program is subject to change.