

Syllabus for NUC-5010

ATMOSPHERIC DISPERSION OF RADIOISOTOPES

COURSE DESCRIPTION

This course examines the prediction of radiological consequences from the dispersion of airborne radioactive effluents. The theoretical models are substantiated by meteorological data and dose assessment. The applications phase will link the Nuclear Regulatory Commission (NRC) code RASCAL to nuclear facility licensing, compliance, and emergency planning. Use of the code for analysis and evaluation is incorporated into the course as instruction.

COURSE OBJECTIVES

After completing this course, you should be able to:

- CO1** Describe design basis accident conditions, with the focus on radioactive effluent release.
- CO2** List sources and source strengths of airborne radioactive effluents during design basis accident conditions.
- CO3** Write and explain the governing equations that form the basis of transport and dispersion models.
- CO4** Describe how local meteorological data is incorporated into dispersion models.
- CO5** List and outline the content of industry regulatory guides used for licensee compliance.
- CO6** Perform hand calculations of effluent dispersion, identifying assumptions rendering applicability of results.
- CO7** Describe industry uses of radiological consequence codes in regard to nuclear facility licensing, compliance, and emergency planning.
- CO8** Describe the capabilities of the Radiological Assessment System for Consequence Analysis (RASCAL).
- CO9** Describe required input to RASCAL to facilitate useful output.
- CO10** Perform analysis and evaluation with RASCAL.

COURSE MATERIALS

You will need the following materials to complete your coursework. Some course materials may be free, open source, or available from other providers. You can access free or open-source materials by clicking the links provided below or in the module details documents. To purchase course materials, please visit the [University's textbook supplier](#).

Instructions for Obtaining RASCAL Code

Click on the following link, which will take you to the RAMP webpage where you can apply for membership to obtain the RASCAL Version 4.3: [Registration for the RASCAL Code](#).

1. **Choose your user type:** Choose US University Staff or Student under Domestic User and then select CHOOSE PLAN.
2. **Select a membership plan:** Click the SELECT button at the end of the All Access list and then select TELL US ABOUT YOU.
3. **Fill out the Tell Us About You form.** Be sure to select RASCAL (Premium Code) in the Codes to subscribe to the section.
4. **NDA Instructions:** Download the NDA, fill it out and sign it. You can sign and send it digitally to the email provided or manually complete and fax it to the number provided.
5. **Select SUBMIT** at the bottom of the webpage.
6. Once your completed NDA is received, you will receive an email notifying you that you have access.

Illustrated instructions for this process are available in the [RAMP Instructions Document](#).

Links to the RASCAL Code

In the RASCAL Navigation block you will also find links to download the RASCAL User's Guide, RASCAL Technical Documents, RASCAL Change Logs, and RASCAL Support.

- [RASCAL 4.3 User's Guide](#)
- [RASCAL 4.3 Workbook](#)
- [RASCAL 4.3 Technical Supplement](#)
- [RSICC Code Package CCC-783](#)

COURSE STRUCTURE

Atmospheric Dispersion of Radioisotopes is a three-credit online course, consisting of **six** modules. Modules include learning objectives, study materials, and activities.

ASSESSMENT METHODS

For your formal work in the course, you are required to take part in **six** graded discussion forums, submit **three** written assignments, and complete **four** calculation problems using RASCAL.

Consult the Course Calendar for due dates.

Promoting Originality

One or more of your course activities may utilize a tool designed to promote original work and evaluate your submissions for plagiarism. More information about this tool is available in [SafeAssign](#).



Discussion Forums

In addition to an ungraded Introductions Forum, you are required to participate in **six** graded online class discussions—one in each module.

Communication with your mentor and among fellow students is a critical component of online learning. Participation in online class discussions involves two distinct activities: an initial response to a discussion question and **at least** two subsequent comments on classmates' responses.

All of these responses must be substantial. Meaningful participation is relevant to the content, adds value, and advances the discussion. Comments such as "I agree" and "ditto" are not considered value-adding participation. Therefore, when you agree or disagree with a classmate or your mentor, state **and support** your position.

You will be evaluated on the quality and quantity of your participation, including your use of relevant course information to support your point of view, and your awareness of and responses to the postings of your classmates. Remember, these are discussions: responses and comments should be properly proofread and edited, mature, and respectful.



Written Assignments

You are required to complete **three** written assignments. Each written assignment tests you on the reading material assigned.



RASCAL Calculation Problems

You are required to complete **four** calculation problems using RASCAL. Each problem tests you on your ability to use the software successfully.

GRADING AND EVALUATION

Your grade in the course will be determined as follows:

- **Discussion forums (6)**—10 percent
- **Written assignments (3)**—30 percent
- **RASCAL calculation problems (4)**—60 percent

All activities will receive a numerical grade of 0–100. You will receive a score of 0 for any work not submitted. Your final grade in the course will be a letter grade. Letter grade equivalents for numerical grades are as follows:

A	=	93–100	B	=	83–87
A–	=	90–92	C	=	73–82
B+	=	88–89	F	=	Below 73

To receive credit for the course, you must earn a letter grade of C or better (for an area of study course) or D or better (for a course not in your area of study), based on the weighted average of all assigned course work (e.g., exams, assignments, discussion postings).

STRATEGIES FOR SUCCESS

First Steps to Success

To succeed in this course, take the following first steps:

- Read carefully the entire Syllabus, making sure that all aspects of the course are clear to you and that you have all the materials required for the course.
- Take the time to read the entire Online Student Handbook. The Handbook answers many questions about how to proceed through the course, how to schedule exams, and how to get the most from your educational experience at Thomas Edison State University.
- Familiarize yourself with the learning management systems environment—how to navigate it and what the various course areas contain. If you know what to expect as you navigate the course, you can better pace yourself and complete the work on time.
- If you are not familiar with Web-based learning be sure to review the processes for posting responses online and submitting assignments before class begins.

Study Tips

Consider the following study tips for success:

- To stay on track throughout the course, begin each week by consulting the Course Calendar. The Course Calendar provides an overview of the course and indicates due dates for submitting assignments and posting discussions.
- Check Announcements regularly for new course information.

COMMITMENT TO DIVERSITY, EQUITY, AND INCLUSION

Thomas Edison State University recognizes, values, and relies upon the diversity of our community. We strive to provide equitable, inclusive learning experiences that embrace our students' backgrounds, identities, experiences, abilities, and expertise.

ACCESSIBILITY AND ACCOMMODATIONS

Thomas Edison State University recognizes disability as a facet of diversity and seeks to advance access to its educational offerings. Students with disabilities may seek accommodations by contacting the Office of Student Accessibility Services via email at ada@tesu.edu or phone at (609) 984-1141, ext. 3415. Individuals who are deaf or hard of hearing may call the TTY line at (609) 341-3109.

ACADEMIC POLICIES

To ensure success in all your academic endeavors and coursework at Thomas Edison State University, familiarize yourself with all administrative and academic policies including those related to academic integrity, course late submissions, course extensions, and grading policies.

For more, see:

- [University-wide policies](#)
- [Undergraduate course policies and regulations](#)
- [Graduate academic policies](#)
- [Nursing student policies](#)
- [Academic code of conduct](#)