

New Jersey Institute of Technology
Digital Commons @ NJIT

Chemical and Materials Engineering Syllabi

NJIT Syllabi

Spring 2020

CHE 624-102: Transport Phenomena

David C. Venerus

Follow this and additional works at: <https://digitalcommons.njit.edu/cme-syllabi>

Recommended Citation

Venerus, David C., "CHE 624-102: Transport Phenomena" (2020). *Chemical and Materials Engineering Syllabi*. 105.

<https://digitalcommons.njit.edu/cme-syllabi/105>

This Syllabus is brought to you for free and open access by the NJIT Syllabi at Digital Commons @ NJIT. It has been accepted for inclusion in Chemical and Materials Engineering Syllabi by an authorized administrator of Digital Commons @ NJIT. For more information, please contact digitalcommons@njit.edu.

CHE 624
Transport Phenomena
Spring 2019

Instructor: David C. Venerus
204 LSEC, venerus@njit.edu
Office Hours: Mon & Wed 9:00-10:30 AM, or by appointment.

Teaching Assistant: Chadakarn (Gift) Sirasitthichoke
312 Tiernan cs437@njit.edu
Office Hours: Tues & Fri 4:00-5:30 PM, or by appointment.

Course Objective: To analyze momentum, heat and mass transfer phenomena that occur in chemical, materials, and biological processes with an emphasis on problem formulation, solution and interpretation.

Textbook:

A Modern Course in Transport Phenomena (MCTP), D.C. Venerus & H.C. Öttinger, Cambridge U. Press (2018).

Reference:

Transport Phenomena, R.B. Bird, W.E. Stewart & E.N. Lightfoot (BSL) John Wiley & Sons (2002).

Canvas: Announcements, assignments, solutions etc., posted at <https://canvas.njit.edu>

Grading: Exam 1 (30%), Exam 2 (30%), Final Exam (30%), Exercises (10%)

Exercises: Graded (2,1,0) by Teaching Assistant and solutions posted on Canvas.

Computer Skills: Several problems will be assigned that require basic numerical methods to solve. It is the student's responsibility to be familiar with the use of computing software such as MATLAB, Mathematica, or similar computing tools.

ADA Statement: Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Office of Accessibility and Resources. Please go to <https://www.njit.edu/studentsuccess/accessibility/> for further information.

Academic Integrity: The NJIT Honor Code and Standards of Academic Integrity will be enforced in this course. Any violation will be immediately brought to the attention of the Dean of Students. Students are encouraged to read and be familiar with the University Code on Academic Integrity, which can be found at <https://www.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>

CHE 624
Transport Phenomena
Outline (MCTP)

1. **Introduction (1.1-1.3) and Math Review**
2. **The Diffusion Equation (2.1-2.4)**
3. **Equilibrium Thermodynamics (4.1-4.6)**
4. **Balance Equations (5.1-5.4)**
5. **Forces and Fluxes (6.1-6.6)**
6. **Measuring Transport Coefficients (7.1-7.5)**
EXAM 1
7. **Pressure-Driven Flows (8.1-8.5)**
8. **Heat Exchangers (9.1-9.3)**
9. **Gas Absorption (10.1-10.3)**
10. **Driven Separations (11.1-11.2)**
EXAM 2
11. **Thermodynamics of Interfaces (13.1-13.4)**
12. **Interfacial Balance Equations (14.1-14.3)**
13. **Transport Around a Sphere (17.1-17.3)**
14. **Bubble Growth and Dissolution (18.1-18.5)**
FINAL EXAM