MOHAWK VALLEY COMMUNITY COLLEGE

UTICA & ROME, NEW YORK

COURSE OUTLINE

SOIL MECHANICS & FOUNDATIONS

CT 222

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**Course Outline:** **CT 222 – Soil Mechanics & Foundations**

1. **Catalog Description**

CT 222 Soil Mechanics & Foundations [C-3, P-2, CR-4]

This course introduces fundamental concepts of geotechnical engineering. The major topics of study include the strength, compressibility, and other engineering properties of soil and the effects of water on these properties. The theories of soil mechanics are applied to the design of foundations, retaining walls, and earth structures. Methods of performing field explorations are discussed. Practicums include the performance of standardized laboratory tests in order to evaluate/determine various engineering properties of soil as a building material.

Corequisite: CT 221 Strength of Materials: Civil

1. **Materials**

Scientific calculator, engineering computation paper, 1” (minimum) 3-ring binder

1. **Course Objectives**

The purpose of this course is to familiarize students with the fundamentals of soil mechanics and its application to engineering design and construction. Laboratory work is devoted to performing tests in accepted use for determining soil properties. Practicums introduce students to equipment and procedures used for the testing of soil. The foundation portion familiarizes the student with the procedures to design building foundations and earth structures.

1. **Student Learning Outcomes** *(ETAC-ABET Assessment Criteria)*
2. Students will be able to conduct standard field and laboratory tests of soil. (3, 4, 5)
3. Students will be able to prepare detailed technical reports. (3)
4. Students will be able to classify soils based on classification tests & index properties. (3)
5. Students will be able to apply knowledge and principles to solve soil mechanics problems relating to subsurface flow, permeability, capillarity, seepage, etc. (1, 2)
6. Students will be able to calculate stresses in subsurface soil masses. (1, 2)
7. Students will be able to calculate settlement in regards to soil compression, volume distortion, and consolidation. (1, 2)
8. Students will be able to perform calculations pertaining to foundations and earth retaining structures. (1, 2)
9. Students will be able to demonstrate the ability to use basic software (Word, Excel, PPT).
10. Students will be able to function effectively as a member of a team. (5)
11. **Major Topics**

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| **Week** | **Topic** |
| 1 | Introductions and fundamentals |
| 2 | Soil types and structures |
| 3 | Soil composition, terms, and definitions |
| 4 | Index properties, classification tests, and site investigations |
| 5 | Permeability and capillarity |
| 6 | Subsurface stresses |
| 7 | Subsurface stresses |
| 8 | Settlement |
| 9 | Settlement |
| 10 | Shallow foundations |
| 11 | Deep foundations |
| 12 | Site improvements and earthwork |
| 13 | THANKSGIVING BREAK - ENJOY YOUR TIME OFF!! |
| 14 | Geosynthetics |
| 15 | Research/Oral presentations |