| Course Name | **THEORY OF COMPUTATION** | Course Code | **COMP 535** | | |
|---|---|---|---|---|---|

| Credit Hours | 3 | Contact Hours | Lec | Lab | Total |
|---|---|---|---|---|---|
| | | | 2 | 2 | 4 |

| Offered as | ☐ University Requirement ☐ College Requirement ☒ Program Requirement ☒ Core ☐ Elective |
|---|---|
| | ☐ ITEC            ☒ COMP            ☐ CNET |

| Level | 3 | Prerequisite | NONE |
|---|---|---|---|

**Course Description:**

This course provides students with an understanding of basic concepts in the theory of computation. It covers a variety of issues in the mathematical development of computer science theory, particularly finite representations for languages and machines, as well as gain a more formal understanding of algorithms and procedures. The topics include introduction to the theory of computation, including models of computation such as Turing machines; theory of programming languages, including grammars, parsing, syntax and semantics.

**Upon completion, the student will be able to:**

♦ Define languages by abstract, recursive definitions and by regular expressions.
♦ Construct finite state machines and the equivalent regular expressions.
♦ Prove the equivalence of languages described by finite state machines and regular expressions.
♦ Construct pushdown automata and the equivalent context free grammars.
♦ Construct turing machines and post machines.
♦ Determine decidability, finiteness and equivalence properties.

| Assessment Methods | **Exam-1** | ☒ | 10% | **Exam-2** | ☒ | 10% | **Assignments** | ☒ | 20% |
|---|---|---|---|---|---|---|---|---|---|
| | **Attendance** | ☐ | - | **Lab Exam** | ☒ | 20% | **Final Exam** | ☒ | 40% |

**Text Book:**
♦ Floyd, R. W. and Beigel, R. The Languages of Machines: An Introduction to Computability and Formal Languages. New Freivalds, Rusins, Fundamentals of Computation Theory, Springer, 2001.
♦ Hopcroft, John E., and Ullman, Jeffery D., Introduction to Automata Theory, Languages, and Computation Second Edition, Addison-Wesley, 2001.

**References:**
♦ Gurari, E. M. An Introduction to the Theory of Computation. New York: Computer Science Press,1989Kevin P. Murphy, "Machine Learning: A Probabilistic Perspective", The MIT Press, 1st Edition, ISBN 978-0-262-01802-9, 2012.
♦ Introduction to Computer theory, Second Edition, Daniel I.A. Cohen., John Wiley & Sons, Inc., New York, 1997