INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

NAME OF DEPT./CENTRE**:** **Electronics and Computer Engineering**

1. Subject Code**:** **EC - 354**   Course Title**:** **Compiler Design**

2. Contact Hours: **L: 3**   **T: 1**   **P: 0**

3. Examination Duration (Hrs.):   **Theory** | **0** | **3** | **Practical** | **0** | **0** |

4. Relative Weightage**:** **CWS** | **25** | **PRS** | **00** | **MTE** | **25** | **ETE** | **50** | **PRE** | **00** |

5. Credits**:** | **0** | **4** | 6. Semester | | **√** | |

          Autumn   **Spring**   **Both**

7. Pre-requisite**:** **EC - 355**

8. Subject Area**:** **DCC**

9. Objective: To introduce students to the techniques used in designing and writing compilers.

10. Details of the Course:

Sl. No.	Contents	Contact Hours
1.	Introduction to the translation process, phases of the compiler, compiler tools.	3
2.	Role of lexical analyzer, specification and recognition of tokens, automatic generation of lexical analyzer.	6
3.	Top down parsing methods, elimination of left recursion, recursive descent and predictive parsers; Bottom up parsing, shift-reduce parsing, precedence parsing, LR parsers, SLR (1) table construction, limitations of SLR parsing, non-SLR (1) grammars; Introduction to canonical and LALR parsing.	8
4.	Type checking, type systems, type expressions, type conversion and overloading.	3
5.	Run time environments, storage organization and allocation strategies, parameter passing, symbol tables.	4
6.	Intermediate code generation, interpreters, intermediate languages, syntax trees, postfix code, triples and indirect triples, syntax directed translation of simple statements.	6
7.	Issues in code generation, basic blocks and flow graphs, next use information, register allocation and assignment, simple code generation.	6
8.	Sources of optimization, optimization of basic blocks, data flow analysis, code improving transformations.	6
	Total	**42**

11. Suggested Books:

Sl. No.	Name of Books / Authors	Year of Publication
1.	Aho, A.V., Lam, M., Sethi, R. and Ullman, J.D., "Compilers: Principles, Techniques and Tools", 2nd Ed., Pearson Education.	2007
2.	Tremblay, J.P. and Sorenson, P.G., "Theory and Practice of Compiler Writing", SR Publications.	2005
3.	Cooper, K.D. and Torczon, L., "Engineering a Compiler", Morgan Kaufmann.	2004
4.	Louden, K.C., "Compiler Construction: Principles and Practice", Course Technology.	1997
5.	Tremblay, J.P. and Sorenson, P.G., "Parsing Techniques: A Practical Guide", Ellis Horwood.	1998