COMPILER DESIGN

Course Code	**12IS5A3**	**CIE Marks**	**100**
L:T:P:S	**3:0:0:1**	**SEE Marks**	**100**
Credits	**4**	**SEE Duration**	**3 Hrs**

Unit-I

Introduction and Syntax-Directed Translation

Language processors; The structure of a Compiler; Syntax-directed definitions; Evaluation orders for SDDs; Applications of syntax-directed translation; Syntax-directed translation schemes; Implementing L-attributed SDD's — **8Hrs**

Unit-II

Intermediate Code Generation : Variants of syntax trees; Three-address code; Types and declarationsTranslation of expressions; Control flow; Back patching; Switch statements, Intermediate code for procedures. — **8Hrs**

Unit-III

Run-Time Environments: Storage Organization; Stack allocation of space, Access to non-local data on the stack, Introduction to Trace-Based Collection, Short-Pause Garbage Collection — **7 Hrs**

Unit-IV

Machine Independent Optimizations

Leaders, Basic blocks and flow graphs, Principle sources of optimization; Introduction to data-flow analysis; Partial redundancy elimination; Loops in flow graphs. — **7 Hrs**

Unit-V

Code Generation

Issues in the design of Code Generator; The Target Language; Addresses in the target code;A Simple Code Generator, Peephole Optimization, Register Allocation and Assignment, Instruction selection by tree rewriting — **6Hrs**

Course Outcome

1 Describe working of each phase in the development of a compiler
2 Apply syntax directed translation rules to generated intermediate code
3 Design a compiler for a simple customized high level language
4 Generation of basic block and flow graphs for intermediate code
5 Apply different optimization methods on intermediate code to generate optimized code

References

1 Alfred V Aho, Monica S.Lam, Ravi Sethi, Jeffrey D Ullman: Compilers- Principles, Techniques and Tools, 2nd Edition, Pearson Education, ISBN: 978-8-13172-101-8, 2007
2 Kenneth C Louden: Compiler Construction Principles & Practice, Cengage Learning, *ISBN*-10: 0534939724 | *ISBN*-13: 978-0534939724,1997
3 Charles N. Fischer, Richard J. leBlanc, Jr.: Crafting a Compiler with C, Pearson Education,*ISBN*-13: 978-0805321661 *ISBN*-10: 0805321667,1991
4 Andrew W Apple: Modern Compiler Implementation in C, Cambridge University Press, *ISBN* 0-521-60765-5,1997

Scheme of Continuous Internal Evaluation for Theory

CIE consists of Three Tests each for 40 marks (15 marks for Quiz + 25 marks for descriptive) out of which best two will be considered. In addition 20 marks to be earned through self study on emerging topics.

Scheme of Semester End Evaluation for Theory

Question No. 1 consisting of objective type /short type questions covering the entire syllabus. It is compulsory and carries 20 marks. There are five units. Each unit will have two questions of 16 marks each, students have to answer one question from each unit.