Faculty of Science and Technology
R.T.M Nagpur University, Nagpur
Syllabus for B.Tech. Sixth Semester CT
Compiler Design (Theory)

Total Credits: 03	Subject Code: BTCT601T
Teaching Scheme : **Lectures: 03 Hours/Week** **Tutorials: 00 Hours/Week** **Practical: 00 Hours/Week**	**Examination Scheme :** **Duration of University Exam : 03 Hrs.** **College Assessment : 30 Marks** **University Assessment:70 Marks**

Course Objectives:

1. To make students to understand basics of Compilation Process.
2. To make students to understand thoroughly the concepts of various phases of Lexical Analysis, Syntax Analysis, Syntax Directed Translation Scheme.
3. To make students to understand Code generation and code Optimization techniques

Course Outcomes:

After completing the course, students will be able to

1. Explain basic fundamentals of the translators and role of the lexical analysis.
2. Describe principles of Parsing and will be able design various Top-Down and Bottom-Up Parsers
3. Explain various forms of intermediate code and will be able to demonstrate use of SDTS to translate elementary programming constructs.
4. Describe various optimization techniques and will be able to develop simple code generators.
5. Explain storage allocation methods, error recovery techniques and will be able to apply various error recovery techniques in parsers.

Unit I **(06 Hrs)**

Translators, Compilers, Interpreters, Just in Time Compilers, Cross Compilers, Bootstrapping, Structure of a typical compiler, overview of lexical analysis, syntax analysis, code optimization and code generation, design of lexical analyzer.

Unit II **(08 Hrs)**

Parsers, Shift-Reduce Parser, Top-down parser, Predictive Parsers, Bottom up parsing technique, LR parsing algorithm, Design of SLR, LALR, LR parsers.

Unit III **(08 Hrs)**

Syntax directed schemes, intermediate code, Prase trees, Syntax trees, three address code, Quadruples, Triples, Indirect Triple, using syntax directed translation schemes to translate assignment statements, Boolean expressions, if then else structures

Unit IV **(08 Hrs)**

Sources of Optimization, Loop Optimization, DAG representation of basic blocks, Global data flow analysis, Dominators, Loop invariant computations, Induction variable elimination, Loop unrolling, Loop jamming., simple code generator, Register allocation and assignment

Unit V **(06 Hrs)**

Storage allocation and run time storage administration, symbol table management, types of Errors,Lexical phase Errors, Syntactic phase Errors, error recovery in LR parsing, error recovery in LL parsing,

Text Books:

1. Alfred V.Aho, Jeffrey Ullman :Principals of Compiler Design, ,Narosa Publications.
2. O.G. Kakde : Compiler Design , Laxmi Publication , 4th Edition.

Reference Books:

1. Fischer and LeBlanc: Crafting a compiler:, Addison Wesley

Compiler Design (Practical)

Total Credits: 01	Subject Code: BTCT601P
Teaching Scheme: Lectures: 00 Hours/Week Tutorials: 00 Hours/Week Practical: 02 Hours/Week	Examination Scheme: College Assessment: 25 Marks University Assessment:25 Marks

Minimum ten experiments should be conducted based on the theory syllabus.