GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Bachelor of Technology					Branch/Spec.	Computer Science and Business Systems		
Semester	V					Version	1.0.0.0		
Effective from Academic Year	2023-24					Effective for the Batch admitted in			July 2021
Course Code	2CSBS5102	Course Name				Compiler Design			
Teaching Scheme						Examination Scheme (Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	2	-	5	Theory	40	60	100
Hours	3	0	4	-	7	Practical	30	20	50

Pre-requisites

Theory of computations

Course Outcomes

On successful completion of the course, the students will be able to:

CO1	develop the lexical Analyzer for specific grammar
CO2	design top-down and bottom-up parsers for a specifically given grammar
CO3	develop syntax-directed translation schemes
CO4	develop algorithms to generate code for a target machine

Theory Syllabus

Unit	Content	Hrs.
1	**Introduction:** Phases of compilation and overview. Lexical Analysis (scanner): Regular languages, Finite automata, Regular expressions, Relating regular expressions and finite automata, Scanner generator (lex, flex).	06
2	**Syntax Analysis (Parser):** Context-free languages and grammars, Push-down automata, LL(1) grammars and top-down parsing, Operator grammars, LR(O), SLR(1), LR(1), LALR(1) grammars and bottom-up parsing, Ambiguity and LR parsing, LALR(1) parser generator (yacc, bison)	10
3	**Semantic Analysis:** Attribute grammars, Syntax directed definition, Evaluation and flow of attribute in a syntax tree.	05
4	**Symbol Table:** Basic structure, Symbol attributes and management. Run-time environment: Procedure activation, Parameter passing, Value return, Memory allocation, Scope.	05
5	**Intermediate Code Generation:** Translation of different language features, Different types of intermediate forms.	04
6	**Code Improvement (optimization):** Control-flow, Data-flow dependence etc.; Local optimization, Global optimization, Loop optimization, Peep-hole optimization etc.	05
7	**Architecture dependent code improvement:** Instruction scheduling (for pipeline), Loop optimization (for cache memory) etc. Register allocation and Target code generation.	05
8	**Advanced topics**: Type systems, Data abstraction, Compilation of Object Oriented features and non-imperative programming languages.	05

Practical Content

Assignments and Practicals are based on the Syllabus.

Text Books

1	Compilers: Principles, Techniques and Tools by V. Aho, R. Sethi and J. Ullman.
2	Lex & Yacc by Levine R. John, Tony Mason and Doug Brown

Reference Books

1	Concept of Compiler Design, By Adesh K. Pandey.

ICT/MOOCs Reference

1	https://nptel.ac.in/courses/106/108/106108113/
2	https://nptel.ac.in/courses/106/105/106105190/

Mapping of CO with PO and PSO:															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	1	0	0	0	1	0	0	0	3	0	0
CO2	3	3	3	1	1	0	0	0	1	0	0	0	2	0	0
CO3	3	3	3	1	0	0	0	0	1	0	0	0	1	0	0
CO4	3	3	3	1	1	0	0	0	1	0	0	0	0	1	0