Birla Institute of Technology & Science, Pilani – K K Birla Goa Campus
Second Semester: 2018-2019
Course Handout (Part II)

In addition to Part -I (General Handout for all courses appended to the Time-Table) this portion gives further details pertaining to the course.

Course No. **: CS F363**
Course Title**: Compiler Construction/Compiler Design.**
Instructor-in-Charge**: Soumyadip Bandyopadhyay**
Instructor**: Gargi Alavani**
Instructor**: Kankipati Likhitha**
Instructor**: Bandana**
E-mail: soumyadipb@goa.bits-pilani.ac.in

Course Description:

Review of compiler process, phases and passes, bootstrapping of compilers; formal languages, grammars and abstract machines; lexical analysis, regular expressions and finite automata; context-free grammars and push-down automata; recursive-descent, LL and LR parsers; tools to design and produce a compiler; syntax directed translation and code generation.

1. Scope & Objective:

This course aims at understanding the fundamental concepts and components of compiler design like translators, parsers and scanners. The primary objective is to emphasize design and implementation issues with a hands-on approach to compiler construction tools for the systems programmer. It also aims at providing the student adequate background so as to enable him / her to gain good design skills needed for designing and building tools around a programming language, tools other than compilers and interpreters, like IDEs and smart editors. Skills in text-processing for text-based data mining also are expected to be acquired along the way.

2. Text Book:

T_1. Aho, Lam, Sethi, Ullman. Compilers - Principles, Techniques and Tools, 2/e. Pearson, (Indian Reprint) 2007. (Called *dragonbook* on the Net.)

3. Reference Books:

R_1. Michael L. Scott. *Programming Language Pragmatics (3/e)*. Morgan Kaufmann/Elsevier Indian Reprint, 2010.

R_2. Cooper, K. D. and Torczon, L. Engineering a Compiler, 2/e. Elsevier India, 2011.

4. Course Plan:

Lectures	Topic	Text/Ref
1	Introduction	Notes,
2-10	Lexical Analysis, Regular Expressions, and Finite Automata	**T_1** Ch 3.1–3.4, 3.6–3.9
11-20	Syntax Analysis, Context-Free Grammars, and Top-Down Parsing	**T_1** Ch 4.1–4.4 4.1-4.4
21-28	Bottom-up Parsing	**T_1** Ch 4.5, 4.6, 4.7.1, 4.7.2, 4.7.3, 4.8

29-31	Semantic Analysis : Syntax-Directed Translation	$\mathbf{T_1}$ Ch 5.1, 5.2, 5.3, and only 5.5.4
32-35	Code Generation	$\mathbf{T_1}$ Ch 6.1, 6.2, 6.3.1, 6.3.2, 6.5.2, 6.5.5, 6.6, 6.7. Ch 8.1, 8.2.1, 8.4, 8.6, 8.7 (except 8.7.4), 8.8.4, 8.10
1-10	Tutorials : Use of `flex`, *LLVM* and `bison` and other tools	Manuals, notes.

5. Evaluation Scheme

#	Evaluation Component	Wt	Date	Time	Exam Type
1	Mid Semester Test	30%	14/3/2019	2:00 PM - 3:30 PM	Closed Book
2	Compre	40%	09/05/19	AN	Closed Book
3	Class Test I	15%	Moodle Announced tests in class		Open book
3	Class Test II	15%	Moodle Announced tests in class		Open book

6. Open and Closed Book

Laptop, or any other electronic devices are not allowed under any circumstances.
Open book:
Text book, your personal notes, class notes, teaching material are allowed.
Partly Open book:
Only your personal class notes (notebook with your own handwritten notes) are allowed.
Closed book:
Nothing is allowed.

7. Chamber Consultation: On a need basis.

8. Notices: All notices concerning this course will be mainly declared in the class, tutorial sessions, and through Moodle. You should regularly login to Moodle to check notices as Moodle's push notification mechanism is unreliable.

9. Make-up Policy: Prior permission is needed. Otherwise, zero will be awarded for that component without make-up. Granting make-up is the sole discretion of the IC.

10. Recheck Policy: While students are encouraged to defend their approach of answering a question and they can ask for a recheck during the midterm and comprehensive examination, the following rules are applied:

1. It is essential to go through the answer key before the recheck request. If during evaluation it is found that the answer key is not consulted, the recheck request will be summarily rejected.

2. During recheck, all the questions including the requested question will be reevaluated once again carefully and objectively. This may result in reduction in marks to the questions (which may or may not have been requested for a recheck) where lenient marking policy have been adopted in the first round of marking.

Instructor-In-Charge, CS F363

February 21, 2019