Course title	**Programming for Engineers**
Course number	COMP 215
Credit hours (lecture and lab)	3 (2 + 1)
ECTS (weekly contact and self-study load)	6 (3 + 3)
Prerequisites/co-requisites by course number and name	COMP 208 Programming I
Prerequisites by topic (other than the formal prerequisites above)	None
Level and type (compulsory, elective)	BE core course
Year of study and semester	Any
Catalogue description	Programming in Python for engineers: language, use of external libraries, runtime analysis, applications from data analysis and engineering. Topics include expressions, functions, conditionals and iteration, modeling information as data, object-oriented programming, and useful programming practice like source control, and testing.
Objectives	This course introduces the concepts, principles, and methods of Programming in engineering applications. The students are also introduced to the use of modern programming languages like python.
Intended learning outcomes	Upon successful completion of this course, students will be able to:

No	Intended learning Outcome (ILO)	PLO*
1	Introduction to programming for engineering applications.	1, 2, 4, 6
2	Understanding the concept of expression and function definition.	1, 2, 6
3	Implementation of conditional statement and iteration loops.	1, 2, 6
4	Design of data structure and models.	1, 2, 6, 7
5	Introduction to the object-oriented programing style.	1, 2, 6, 7
6	Evaluate the performance of different programming functions.	6, 7

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	7	Orientation over useful programming tools for performance analysis and testing.	3, 5, 6, 7

(*) The Program learning outcome (PLOs) are listed in the appendix

Teaching and learning methods	Development of ILOs is promoted through the following teaching and learning methods: • The Programming Lab. is open for the students to practice the practical aspects and solve the programming homework assignments. • The student attends the class presentations and participates in the discussions. • The student joins the related online team/group and participates in its discussions. • The student studies the reference material, including books and videos. • The student solves the programming assignments. • The student carries out a term project. • The student develops a professional report for the term report. • The student presents the term project in class.
Learning material type	Textbook, class handouts, some instructor keynotes, selected YouTube videos, and access to a personal computer and the internet.
Resources and references	A- Required book(s), assigned reading and audio-visuals: 1. Sandeep Nagar. Introduction to Python for Engineers and Scientists. APress. B- Recommended book(s), material and media: 2. David J. Pine, Introduction to Python for Science and Engineering. CRC Press.

Topic outline and schedule	Week	Topic	ILO	Resources
	1-2	Introduction to Python Basics	1, 7	1, 2
	3	IPython	1, 6, 7	1
	4	Data Types	1, 4	1, 2
	5	Operators	1, 2, 4	1
	6-7	Arrays	4, 5	1, 2
	8-9	Plotting	6, 7	1, 2
	10-11	Functions and Loops	2, 3	1, 2
	12-13	Object-Oriented Programming	4, 5	1
	14	Numerical Computing Formalism	6, 7	1, 2
	15	Project Presentations	All	

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Evaluation tools	Opportunities to demonstrate achievement of the ILOs are provided through the following assessment tools:

Assessment tool	Mark	Topic(s)	Time
Homework assignments	10%	Programming	W1-W14
Midterm exam	30%	Applications	W8
Term project report and presentation	20%	Practical and presentation aspects	W3-W15
Final exam	40%	All material	W16
Total	**100%**		

Student requirements	The student should have a computer and internet connection.
Course policies	A- Attendance policies:

A- Attendance policies:

- Attendance is required. Class attendance will be taken every class and the university polices will be enforced in this regard.

B- Absences from exams and not submitting assignments on time:

- A makeup exam can be arranged for students with acceptable absence causes.
- Assignments submitted late, but before announcing or discussing the solution can be accepted with 25% penalty.
- The project report must be handed in in time.

C- Health and safety procedures:

- All health and safety procedures of the university and the school should be followed.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

- Open-book exams
- All submitted work must be of the submitting student.
- Other text or code must be properly quoted with clear source specification.
- Cheating will not be tolerated.

E- Available university services that support achievement in the course:

- Moodle course page
- Programming Lab for practicing the practical aspects and solving the programmingassignments.
- Program announcements Facebook group

Additional information	None