



University of Kerala

Discipline	Mathematics				
Course Code	UK3DSEMAT200				
Course Title	Programming with $\LaTeX$ and Python				
Type of Course	DSE				
Semester	III				
Academic Level	200-299				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours per week
	4	3	0	2	5
Pre-requisites	1. Basic computer knowledge				
Course Summary	This course provides basic skill in $\LaTeX$ and python programming				

Detailed Syllabus

Module	Unit	Contents	Hrs
I		Basics of Type setting using $\LaTeX$	20
	1	Simple typesetting, Fonts, Type size Typesetting Mathematics,	
	2	Single Equations (equation, equation*, split) Group of Equations (gather, gather*, align, align*, cases) Matrices and Determinants (matrix, pmatrix, bmatrix, vmatrix) Putting one over another (frac, dfrac, int, lim, sum, prod). Chapter 1: Sections 8.1, 8.3.1, 8.3.2, 8.4.2 and 8.4.4 of Text [3].	
	3	Basics of typesetting Theorems and amsthm package (Sections 9.1 to 9.2.1 of Text [1]). Do Exercise questions 4, 5, 6 and 7 of Chapter 9 of Text [2].	
II		Tables, Figures and Presentation	20
	4	Typesetting basic tables. Merge cells using $\backslash multicolumn$ (Chapter 7: Section 7.2 of Text [3], except the portion using $\backslash renewcommand$)	

Module	Unit	Contents	Hrs
	5	Inserting pictures using Graphicx package (Chapter 12: Section 12.1.1 to 12.1.3 of Text [1], except the portion on pstricks)	
	6	Creating Floating Figures (Chapter 11: Section 11.1.1 of Text [3])	
	7	Beamer Presentation, Thinking in terms of frames. Set up a Beamer document, Enhance a Beamer presentation. (Chapter 11: Sections 11.1 to 11.4 of Text [2], except the portion using pstricks)	
III	The Essentials of Python		20
	8	Absolute Basics - Lists, tuples and sets - Strings - Control Flow - Functions - Reading and writing files (Chapter 4, 5 (Sections 5.6, 5.8 need not be discussed), 6 (Section 6.5 to 6.9 need not be discussed), 8, 9.1 to 9.5 (Section 9.3 need not be discussed) and 13.1 to 13.4 of Text [4])	
IV	Working with numbers		15
	9	Basic Mathematical Operations - Working with different kinds of numbers - Getting user input - Math Programmes - The Programming challenges mentioned in Chapter 1 of Text [1]	

Textbooks

1. Amit Saha, Doing Math with Python, No Starch Press, 2015.
2. Donald Binder and Martin Erickson, A student's guide to the study, practice and tools of modern mathematics, CRC Press, 2010.
3. E. Krishnan, The $\LaTeX$ Tutorial: A Primer, by The Tutorial Team, Indian $\TeX$ Users Group, Sayahna Foundation, <http://www.sayahna.org>, 2020.
4. Naomi Ceder, The Quick Python Book, Manning, 2018.

References

1. E Balagurusamy, Introduction to computing and problem solving using Python, Mc Graw Hill Education, 2017.
2. Dilip Datta, $\LaTeX$ in 24 Hours, A Practical Guide for Scientific Writing, Springer, 2017.
3. Hubert Partl, Irene Hyna and Elisabeth Schlegl, The Not So Short Introduction to $\LaTeX$ 2 ϵ , Tobias Oetiker, Version 6.4, 09 March 2021.
4. Kenneth A Lambert, Fundamentals of Python, First Programs, 2nd Edition, Cengage, 2019.

E- resources

1. https://www.overleaf.com/learn/latex/Learn_LaTeX_in_30_minutes
2. <https://www.python.org/>

Course Outcomes

CO No.	Upon completion of the course the graduate will be able to	PO/PSO	Cognitive Level	Knowledge Category	Lecture(L) Tutorial (T)	Practical (P)
CO 1	Understand the basics of $\text{\LaTeX}$ and python	PSO1, PO7	U	F,C	L	P
CO 2	Create documents and programs	PSO5, PO3	Ap,C	P	L	P
CO 3	Create good quality presentations	PSO5, PO3, 4	Ap, C	P	L	P
CO 4	Apply to the subject and get more insight to the mathematical concepts	PSO2	Ap	M	L	P

(R-Remember, U-Understand, Ap-Apply, An-Analyse, E-Evaluate, C-Create)

(F-Factual, C-Conceptual, P-Procedural, M-Metacognitive)

Mapping of CO with PSOs and POs

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	1												3	
CO2					3				2					
CO3			-	-	3				3	3				
CO4		3												

(- -Nil, 1-Slightly/Low, 2-Moderate/Medium, 3-Substantial/High)

Assessment Rubrics

- Quiz/Assignment/Discussion/Seminar

- Midterm Exam
- Programming Assignments
- Final Exam (Theory and Practical)

Mapping of COs to Assessment Rubrics

	Internal Examination	Assignment	Project Evaluation	End Semester Exam
CO1	✓	✓		✓
CO2	✓	✓		✓
CO3	✓	✓		
CO4		✓		