

## KU5SECMAT301: LaTeX

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
V	SEC	300-399	KU5SECMAT301	2 + 1	60

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
2	2	1	25	50	75	1.5

### Course Description

*This course provides students with a solid foundation in techniques and applications needed to handle LaTeX software for the preparation of articles or books.*

### Course Prerequisite

Higher Secondary Level Mathematics.

### Course Outcomes

CO No.	Expected Outcome	Learning Domains
1	Understand basics of LaTeX	Understand
2	Learn document formatting in LaTeX through various examples	Apply
3	Learn creating Tables & Figures in LaTeX through various examples	Understand
4	Understand using Math Mode in LaTeX through various examples	Understand
5	Learn the content through practicing examples to create LaTeX	Apply

### Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2				✓			
CO 3	✓						
CO 4	✓						
CO 5				✓			

## COURSE CONTENTS

### Contents for Classroom Transaction

M O D U L E	U N I T	DESCRIPTION	HOURS
<b>I</b>	<b>Getting Started (Basics of LaTeX)</b>		<b>11</b>
	1	<b>Hello World</b> – Your first LaTeX document (article class) <ul style="list-style-type: none"> <li>Structure: <code>\documentclass</code>, <code>\begin{document}</code>, <code>\end{document}</code></li> </ul>	
	2	<b>Sections &amp; Paragraphs</b> <ul style="list-style-type: none"> <li>Using <code>\section</code>, <code>\subsection</code>, <code>\paragraph</code></li> </ul>	
	3	<b>Text Formatting</b> <ul style="list-style-type: none"> <li>Bold, italics, underline, font sizes, color</li> </ul>	
	4	<b>Lists</b> <ul style="list-style-type: none"> <li><b>Itemize, enumerate, and description environments</b></li> </ul>	
	5	<b>Adding Comments &amp; Packages</b> <ul style="list-style-type: none"> <li><code>%</code> for comments, <code>\usepackage basics</code></li> </ul>	
<b>Document Formatting</b>			
	1	<b>Title, Author, Date</b> <ul style="list-style-type: none"> <li><code>\title</code>, <code>\author</code>, <code>\date</code>, and <code>\maketitle</code></li> </ul>	

<b>II</b>	2	<b>Page Layout &amp; Margins</b> <ul style="list-style-type: none"> <li>Using geometry package to customize margins</li> </ul>	<b>11</b>
	3	<b>Custom Headers &amp; Footers</b> <ul style="list-style-type: none"> <li>Using fancyhdr to personalize page style</li> </ul>	
	4	<b>Footnotes &amp; Emphases</b> <ul style="list-style-type: none"> <li>Adding \footnote, \emph, custom commands</li> </ul>	
	5	<b>Multicolumn Layout</b> <ul style="list-style-type: none"> <li>Using multicol package</li> </ul>	
<b>III</b>	<b>Tables &amp; Figures</b>		<b>12</b>
	1	<b>Basic Tables</b> <ul style="list-style-type: none"> <li>Using tabular environment</li> </ul>	
	2	<b>Advanced Tables</b> <ul style="list-style-type: none"> <li>Merging cells with multirow, multicolumn, booktabs</li> </ul>	
	3	<b>Inserting Images</b> <ul style="list-style-type: none"> <li>graphicx package, \includegraphics</li> </ul>	
	4	<b>Figure Environments &amp; Captions</b> <ul style="list-style-type: none"> <li>figure, \caption, \label, \ref</li> </ul>	
5	<b>Wrapping Text Around Images</b> <ul style="list-style-type: none"> <li>Using wrapfig package</li> </ul>		
<b>IV</b>	<b>Math Mode</b>		<b>11</b>
	1	<b>Inline &amp; Display Math</b> <ul style="list-style-type: none"> <li><math>( \dots )</math>, <math>[ \dots ]</math>, equation environment</li> </ul>	
	2	<b>Common Symbols</b> <ul style="list-style-type: none"> <li>Greek letters, sums, integrals, fractions</li> </ul>	
	3	<b>Aligning Equations</b> <ul style="list-style-type: none"> <li>Using align and align* from amsmath</li> </ul>	

	4	<b>Matrices</b> <ul style="list-style-type: none"> <li>• bmatrix, pmatrix, using amsmath</li> </ul>	
	5	<b>Theorems, Lemmas, and Proofs</b> <ul style="list-style-type: none"> <li>• amsthm package and environments</li> </ul>	
V		<b>Teacher Specific Module</b>	<b>15</b>
		<i>Directions for Practicals:</i> <i>Students are required to submit output of at least 15 problems from following four modules.</i>	
		<b>Module 1: Getting Started (Basics)</b>  <b>5. Hello World – Your first LaTeX document (article class)</b>  <b>6. Sections &amp; Paragraphs</b> – Using \section, \subsection, \paragraph  <b>7. Text Formatting – Bold, italics, underline, font sizes, color.</b>  <b>8. Lists</b> – Itemize, enumerate, and description environments  <b>5. Adding Comments &amp; Packages</b> – % for comments, \usepackage	
		<b>Module 2: Document Formatting</b>  <b>5. Title, Author, Date</b> – \title, \author, \date, \maketitle  <b>6. Page Layout &amp; Margins</b> – Using geometry package  <b>7. Custom Headers &amp; Footers</b> – Using fancyhdr  <b>8. Footnotes &amp; Emphases</b> – \footnote, \emph  <b>5. Multicolumn Layout</b> – Using multicol package	
		<b>Module 3: Tables &amp; Figures</b>  <b>5. Basic Tables</b> – Using tabular environment  <b>6. Advanced Tables</b> – Merging cells with multirow, multicolumn, booktabs  <b>7. Inserting Images</b> – graphicx package  <b>8. Figure Environments &amp; Captions</b> – figure, \caption, \label  <b>5. Wrapping Text Around Images</b> – Using wrapfig package	
		<b>Module 4: Math Mode</b>  <b>5. Inline &amp; Display Math</b> – $...$ , $[\dots]$ , equation  <b>6. Common Symbols</b> – Greek letters, sums, integrals, fractions	

	<b>7. Aligning Equations</b> – Using align and align* from amsmath <b>8. Matrices</b> – bmatrix, pmatrix <b>5. Theorems, Lemmas, and Proofs</b> – amsthm package	
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### Essential Readings

2. LaTeX - A Document Preparation System User's Guide and Reference Manual - Leslie Lamport. Digital Equipment Corporation, Addison-Wesley Publishing Company, Reading, Massachusetts Menlo Park, California.

### Suggested Readings

1. Modern LATEX, Matt Kline, Second edition (online pdf), typeset October 25, 2022.
2. The Not So Short Introduction to LATEX (or LATEX in 280 minutes), Tobias Oetiker, Marcin Serwin Hubert Partl, Irene Hyna, and Elisabeth Schlegl.
3. A Short Introduction to LaTeX, A book for beginners, Firuza Karmali (Aibara)
4. B.N. Gupta, Business Mathematics and Statistics, SBPD Publications, 2021
5. Knut Sydestar and Peter Hummond with Arne Storm, Essential Mathematics for Economic Analysis, Fourth Edition, Pearson.

### Assessment Rubrics

<b>Evaluation Type</b>	<b>Marks</b>
End Semester Evaluation (ESE)	<b>50 (35 T + 15 P)</b>
Continuous Evaluation (CCA)	<b>25 (15 T + 10 P)</b>
<b>Theory (CCA)</b>	<b>15</b>
(a) Test paper*	8
(b) Assignment	4
(c) Seminar/Viva-voce	3
<b>Practical (CCA)</b>	<b>10</b>
(a) Skill	6
(b) Record	4
<b>Total</b>	<b>75</b>

\* A student has to appear for at least two written tests. Average mark of best two tests is to be considered for internal mark.