

**DEPARTMENT OF MATHEMATICS  
FACULTY OF SCIENCE AND HUMANITIES  
SRM UNIVERSITY**

**LESSON PLAN**

SUBJECT CODE	SUBJECT TITLE	L	T	P	Total of LTP	C
UMA15501	REAL ANALYSIS	4	1	0	5	4
<b>INSTRUCTIONAL OBJECTIVES</b>						
1.	Be thorough with real and complex fields					
2.	Be familiar with metric spaces					
3.	Understand thoroughly the convergence of the sequences and series					
4.	Get exposed to the limits of functions and in detail, derivatives of higher order theorems					

Session	Topics covered	Contact Hours	Reference Book
<b>Unit I : Real Field</b>			
1	Introduction to Real analysis – review of natural numbers/integers/ rationals	1	1,2,3,4
2	Ordered Sets	2	1
3	Field – definition / properties	3	1
4	Real Field	2	1
5	Extended real number system – need for infinity	1	1
6	Complex Field – definition and properties	3	1
7	Euclidean spaces	1	1
8	Tutorial Session for Unit I	2	1,2,3,4
<b>Unit II : Countable and Uncountable Sets</b>			
9	Finite/Countable/Uncountable Sets	3	1
10	Metric Spaces	3	1
<b>Cycle Test I</b>			
11	Compact sets	2	1
12	Perfect sets	2	1
13	Connected sets	3	1
14	Tutorial Session for Unit II	2	1,2,3,4
<b>Unit III : Convergent Sequences</b>			
15	Convergent sequences – subsequences	3	1
16	Cauchy sequences	2	1
17	Upper and lower limits	1	1
18	Some special sequences and series	2	1
19	Series of nonnegative terms	1	1
20	Ratio /root tests	3	1

21	Absolute Convergence	1	1
22	Tutorial Session for Unit III	2	1,2,3,4
<b>Cycle Test II</b>			
<b>Unit IV : Limits and Continuity of Function</b>			
23	Limits of function	2	1
24	Continuous functions	3	1
25	Continuity and connectedness	3	1
26	Monotonic functions	2	1
27	Tutorial Session for Unit III	2	1,2,3,4
<b>Unit V : Mean Value and Taylor's Theorem</b>			
28	Derivative of a real function	1	1
29	Mean value theorems	2	1
30	Continuity of derivatives	2	1
31	L'Hospital rule	2	1
32	Derivatives of higher order	2	1
33	Taylor's Theorem	2	1
34	Differentiation of vector valued functions	2	1
35	Tutorial Session for Unit V	2	1,2,3,4
<b>Model Examination</b>			

**Text Book:**

1. Walter Rudin, "Principles of Mathematical Analysis", 3rd Edition, Major CoreGraw–Hill International Editions, Singapore, Reprint 2012.

**References:**

2. Tom M. Apostol, Mathematical Analysis, 2nd edition, Pearson, Narosa Publishing House, New Delhi, 2002.
3. Richard R. Goldberg, Methods of Real Analysis, Oxford & IBH Publishing Co, Pvt. Ltd., New Delhi, 2010.
4. Sterling K. Berberian, A first course in Real Analysis, 4th Edition, Springer India Pvt. Ltd., 2009.