

**DEPARTMENT OF MATHEMATICS**  
**FACULTY OF SCIENCE AND HUMANITIES**  
**SRM UNIVERSITY**  
**UMA15EO6 - SEQUENCE AND SERIES**  
**(B.Sc. MATHEMATICS)**

**LECTURE SCHEME / PLAN**

The objective is to equip the students of mathematics, the knowledge of Mathematics and its applications so as to enable them to apply them for solving real world problems.

The list of instructions (provided below) may be followed by a faculty relating to his/her own schedule includes warm-up period, controlled/free practice, and the respective feedback of the classes who handle. The lesson plan has been formulated based on high quality learning outcomes and the expected outcomes are as follows

Each subject must have a minimum of 56 hours, which in turn, 45 hours for lecture and rest of the hours for tutorials. The faculty has to pay more attention in insisting the students to have: 95 % class attendance.

<b>UNIT I</b>			
<b>Lect. No</b>	<b>Lesson schedule</b>	<b>Learning outcomes</b>	<b>Cumulative hours</b>
L.1.1	Sequence (definition), examples.	<ul style="list-style-type: none"> <li>➤ Students will be able to understand sequence and will be able to study about its properties.</li> <li>➤ Students will be able to understand the characterizations of the sequence.</li> </ul>	1
L.1.2	Limit, Convergence of a sequence		2,3,4
L.1.3	Cauchy's first theorem on Limits		5,6
L.1.4	Cauchy's general principle of convergence		7,8
L.1.5	Bounded sequences		9
L.1.6	Monotonic sequence always tends to a limit, finite or infinite		10,11
L.1.7	Limit superior and Limit inferior.		12
<b>UNIT II</b>			
L.2.1	Infinite series- Definition of Convergence, Divergence & Oscillation	<ul style="list-style-type: none"> <li>➤ Students will be able to understand concepts of series.</li> </ul>	13
L.2.2	Necessary condition for convergence		14, 15
L.2.3	Convergence of and Geometric series		16,17
L.2.4	Comparison test		18,19
<b>CYCLE TEST - I :</b>			<b>DATE: 21.08.17</b>
L.2.5	D,,Alembert's ratio test	<ul style="list-style-type: none"> <li>➤ Students will be able to test the convergence of the series.</li> </ul>	20,21
L.2.6	Raabe's test		22,23

L.2.7	Simple problems based on above tests		24
<b>UNIT III</b>			
L.3.1	Cauchy's condensation Test	<ul style="list-style-type: none"> <li>➤ Students will be able to understand concepts of Ring and ideals.</li> <li>➤ Students will learn to the concepts of Quotient rings.</li> </ul>	25,26,27,28
L.3.2	Cauchy's root test and their simple problems		29,30,31,32
L.3.3	Alternative series with simple problems		33,34,35,36
<b>CYCLE TEST - II :</b>		<b>DATE:</b>	
<b>UNIT IV</b>			
L.4.1	Binomial Theorem for a rational index	<ul style="list-style-type: none"> <li>➤ Students will learn to more ideal theory.</li> <li>➤ Students will be able to understand concepts of field and integral domain.</li> </ul>	37,38,39
L.4.2	Exponential & Logarithmic series		40,41,42,43
L.4.3	Summation of series & approximations		44,45,46,47,48
<b>UNIT V</b>			
L.5.1	General summation of series	<ul style="list-style-type: none"> <li>➤ Students will be able to understand concepts of summation of series</li> <li>➤ Students will be able to find the nth term of the series.</li> </ul>	49,50
	Summation by difference series		51,52
L.5.2	Successive difference series		53,54
L.5.3	Recurring series		55,56,
L.5.4	A recurring series of the rth order is determined when the first 2r terms are given		57,58
L.5.4	The generating function		59,60
<b>MODEL EXAM</b>		<b>(Duration: 3 Hours)</b>	
<b>LAST WORKING DAY :</b>			

#### TEXT BOOK

T.K. Manicavachagam Pillai, T. Natarajan, K.S. Ganapathy, Algebra, Vol. I, S. Viswanathan Pvt Limited, Chennai, 2004

#### REFERENCES

1. M.K.Singal & Asha Rani Singal, A first course in Real Analysis, R. Chand & Co. 1999.
2. Dr.S.Arumugam, Sequences & Series, New Gamma Publishers, 1999..

Internal marks Total: 50

Internal marks split up: Cycle Test 1: 10 Marks  
Cycle Test 2: 10 Marks

Model Exam: 25 Marks  
Attendance: 5 marks

### **WEB BASED RESOURCES**

<http://www.the-science-lab.com/Math/>

<http://botw.org/top/Science/Math/>

<http://dir.yahoo.com/Science/Mathematics/>

<http://www.cms.caltech.edu/>

<http://www.en.wikipedia.org>