Department of Mathematics

Teaching Plan

Name of the faculty: Dr. Susanta Mandal

Sem III Core Course III: REAL ANALYSIS(Unit-2)

Duration	Topics to be covered			
	1st week	2nd week	3rd week	4th week
First Four Weeks	Real sequence. Bounded sequence	Convergence and non-convergence. Examples	Practice Problems .	Boundedness of convergent sequence. Uniqueness of limit..
Weeks 5 to Weeks 8	Algebra of limits.Relation between the limit point of a set and the limit of a convergent sequence of distinct elements.	Monotone sequences and their convergence.Sandwich rule. Nested interval theorem Cauchy's first and second limit theorems. Practice Related Problems	. Limit of some important sequences : n n 1 n o n , {x n}n , n x 1 n o n , {xn}n with xn+1 xn → l and |l| < 1, n1 + 1 n no n , n 1 + 1 1! + 1 2! + · · · + 1 n! o n , {a xn }n (a > 0).	Subsequence. Subsequential limits, lim sup as the L.U.B. and lim inf as the G.L.B of a set containing all the subsequential limits
Weeks 9 to Weeks 12	lim sup as the L.U.B. and lim inf as the G.L.B of a set containing all the subsequential limits and related problems.	Alternative definition of limsup and liminf of a sequence using inequality or as lim sup xn = inf n sup{xn, xn+1, . . . , } and lim inf xn = sup n inf{xn, xn+1, . . . , } h Equivalence between these definitions is assumed..	A bounded sequence {xn} is convergent if and only if lim sup xn = lim inf xn.	Every sequence has a monotone subsequence Bolzano-Weirstrass theorem for sequence. Cauchy's
Weeks 13 to Weeks 14	Practice Problem	Practice Problem	Class Test	