ACADEMIC PLANNER & UNITIZATION OF SYLLABUS

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Department of Mathematics
Bankura Christian College

ACADEMIC YEAR 2023-24

3rd Semester (July to December)

Theory of Real Functions (Core T5)

Course Objectives: The course will enable the students to
i) to employ the techniques of finding the extremum value of a function.

Course Specific Outcomes: The student acquires the knowledge of analyzing consequences of function's criterion. This course also gives the idea about 0/0 form and corresponding calculations of limits.

Unit 3
Taylor's theorem with Lagrange's form of remainder, Taylor's theorem with Cauchy's form of remainder, concept of convex functions with examples, application of Taylor's theorem to convex functions, relative extrema. Taylor's series and Maclaurin's series expansions of exponential and trigonometric functions, ln(1 + x), 1/ax+b and $(1 + x)n$ with their range of validity, Applications of Taylor's theorem to inequalities.
Statement of L'Hospital's rule, and its associated results, point of local extremum of a function on an interval (ensure to include the concepts of interval in calculus part of T-1: Calculus, geometry and Vector calculus), Sufficient condition for the existence of a local extremum of a function (statement only), determination of local extremum using first order derivative, applications of the principle of maximum/minimum.

MONTH/YEAR	WEEK	PORTIONS
August 2023	3	Taylor's theorem with Lagrange's form of remainder, Taylor's theorem with Cauchy's form of remainder.
	4	Concept of convex functions with examples, application of Taylor's theorem to convex functions.
MONTH/YEAR	**WEEK**	**PORTIONS**
September 2023	1	Relative extrema.
	2	Taylor's series and Maclaurin's series expansions of exponential and trigonometric functions
	3	Taylor's series and Maclaurin's series expansions of exponential and trigonometric functions.

	4	Revision / Tutorial/ Unit Test
MONTH/YEAR	**WEEK**	**PORTIONS**
October 2023	1	ln(1 + x),
	2	(1/ax+b) and $(1 + x)^n$ with their range of validity.
	3	Applications of Taylor's theorem to inequalities
MONTH/YEAR	**WEEK**	**PORTIONS**
November 2023	1	Revision
	2	Statement of L'Hospital's rule, and its associated results, point of local extremum of a function on an interval (ensure to include the concepts of interval in calculus part of T-1: Calculus, geometry and Vector calculus),
	3	Sufficient condition for the existence of a local extremum of a function (statement only).
	4	Revision/Tutorial/Unit Test
MONTH/YEAR	**WEEK**	**PORTIONS**
December 2023	1	Determination of local extremum using first order derivative, applications of the principle of maximum/minimum.
	2	Revision/Tutorial/Unit Test
	3	Study Leave