Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
ING203	Advanced Mathematics I	3	3	2	0	4	5

Prerequisites	
Admission Requirements	

Language of Instruction	
Course Type	Compulsory
Course Level	Bachelor Degree
Objective	This course is the continuation of the ING 104 course. In this context, the objectives of this course are: - Demonstrate to the students the classical techniques [integration by parts and change of variables] to calculate a primitive, - Teach students to handle the comparison relations "to be negligible in front of" and "to be equivalent to" on functions, - Teach how to find a "" simple "" equivalent of a point function to find its limit, - Demonstrate the different convergence criteria for the integrals of positive functions, - Explain in which cases a limited expansion makes it possible to determine the nature of an integral, - Demonstrate the different convergence criteria for series with positive terms, - Explain in which cases a limited development makes it possible to determine the nature of a series
Content	1. Primitives: Definition, properties and first examples. 2. Primitives: Calculation rules [integration by parts and change of variable] 3. Comparison relations: function negligible in front of another, function equivalent to another 4. Comparison relations: calculation rules, comparative growth of logarithms, powers and exponential in 0 and infinity. 5. Comparison relations: Application to the search for limits. 6. Generalized integrals: definition, properties and first examples [Riemann integrals and Bertrand integrals]. 7. Generalized integrals: comparison theorems for positive functions. 8. Generalized integrals: case of functions of any sign. 9. Partial Examination / Ara sinav 10. Generalized integrals: Integrals depending on a parameter 11. Numerical series: definition, properties and first examples [Riemann series and Bertrand series]. 12. Numerical series: comparison theorems for series with positive terms. 13. Numerical series: Case of series of any sign. Convergence criterion of alternating series. 14. Digital Series: Series depending on a parameter
References	1. Lectures notes ans worksheets 2. http://braise.univ-rennes1.fr/braise.cgi 3. http://www.unisciel.fr

Theory Topics

Week	Weekly Contents