

Content

| Course Code | Course Name | Semester | Theory | Practice | Lab | Credit | ECTS |
|-------------|------------------------------------|----------|--------|----------|-----|--------|------|
| MAT201 | Series and Multivariable Functions | 3 | 3 | 2 | 0 | 5 | 8 |

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| Prerequisites | MAT101 VEYA MAT102 |
| Admission Requirements | MAT101 VEYA MAT102 |

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| Language of Instruction | French |
| Course Type | Compulsory |
| Course Level | Bachelor Degree |
| Objective | To teach the notion of convergence of sequences and series To teach certain technics for testing their convergence To enable participants to work with multivariable functions, their limits and derivatives |
| Content | Convergence of series and power series Convergence tests Taylor Series Multivariate functions and their graphs Their limits Notion of continuity for multivariate functions Partial and directional derivatives of multivariate functions Differentiability of multivariate functions |
| References | Analyse 2eme année, François Liret, Dominique Martinais Analiz 1,2, Ali Nesin Calculus, James Stewart |

Theory Topics

| Week | Weekly Contents |
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| 1 | Series, Absolute convergence. |
| 2 | Series with positive terms. Comparison theorems. Riemann series. |
| 3 | Convergence tests: Cauchy, d'Alembert, Abel. |
| 4 | Alternating series |
| 5 | Power Series |
| 6 | Taylor Series |
| 7 | Midterm |
| 8 | Series of functions, pointwise and uniform convergence of series of functions. |
| 9 | Stone-Weierstrass theorem |
| 10 | Multivariate functions, their graphs |
| 11 | Limits of multivariate functions, continuity |
| 12 | Partial derivatives, differentiability |
| 13 | Second derivatives, Schwarz theorem |
| 14 | Optimization of multivariate functions |