M1 MM Part of Dual Degree Program at EMU

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| Course Code | Course Name | Status of the Course |
| Math501 | Analysis | Compulsory |
| Math566 | Linear Algebra | Compulsory |
| Math5XX |  | Elective |
| Math5XX |  | Elective |
| Math5XX |  | Elective |
| Math5XX |  | Elective |
| Math5XX |  | Elective |
| Math598 | Seminar | Compulsory |
| Math500 | Thesis | Compulsory |

* **The students of the dual degree program should take**

**1. Introduction to PDE and**

**2. Numerical simulation/ Scientific Computing I**

**as elective courses.**

**Course Description of Compulsory Courses**

**Math501 ANALYSIS**

N-dimensional Euclidian space, elementary geometry and basic topological notations, covex sets, functions, limits and continuity of transformations, sequences in n-dimensional Euclidian space, Bolzano-Weierstrass theorem, relative neighborhoods, continuous transformations, topological spaces, connectedness, compactness, metric spaces, spaces of continuous functions, noneuclidian norms, directional and partial derivatives, differential functions, relative extrema, convex and concave functions.

**Math566 LINEAR ALGEBRA**

Vector spaces. Linear transformations. Invariant direct sum decompositions, Rational and Jordan forms.

**Math598 SEMINAR**

Guides students in their research and assist them in writing their thesis.   During the course, participants will have the chance to examine authentic academic texts, and analyse such elements as structure, lexis, and style, especially in theses and dissertations to help them develop their academic writing skills.   In addition, during seminars student will also present their research findings and discuss those with other students and professors who are specialized in issues related to Mathematics.

**Math500 THESIS**

Master's thesis includes a student's independent study to be conducted individually under the supervision of a faculty member after completion of theoretical and practical courses.   Therefore, during thesis writing, the student conducts literature review, data collection and analysis, evaluation of the results and presents the written document of these under the supervision of a faculty member.

**List of Elective Courses**

**MATH5XX Introduction to Partial Differential Equations**

**MATH5XX Numerical Simulation**

**MATH5XX Scientific Computing I**

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| --- | --- |
| MATH505 | Complex Analysis |
| MATH505 | **Theory of Partial Differential Equations** |
| MATH507 | **Algebra – I** |
| MATH512 | **Analysis – II** |
| MATH516 | **Measure and Integration** |
| MATH521 | **Probability Theory** |
| MATH522 | **Random Processes** |
| MATH535 | **Topology** |
| MATH553 | **Approximation Properties of Linear Positive Operators** |
| MATH556 | **Quantum Calculus** |
| MATH557 | **Function of Several Variables** |
| MATH561 | **Functional Analysis** |
| MATH564 | **Special Functions** |
| MATH565 | **Fourier Analysis – I** |
| MATH569 | **Numerical Linear Algebra** |
| MATH572 | **Computational Methods in PDE for Science and Engineering** |
| MATH574 | **Advanced Numerical Analysis** |
| MATH576 | **Fractional Calculus** |
| MATH577 | **Fractional Differential Equations** |
| MATH578 | **Theory of Finite Difference Schemes** |
| MATH580 | **Block Method for solving the Laplace equation** |
| MATH583 | **Real Analysis** |
| MATH584 | **Differential Geometry** |
| MATH585 | **Theory of Optimal Control** |
| MATH587 | **Advanced Engineering Mathematics** |
| MATH588 | **Numerical Sol. of Parabolic PDE and Inverse Control Prob.** |