

COURSE SYLLABUS FORM

**American University of Beirut
Faculty of Arts and Sciences
Department of Mathematics
Course Number and Title: Math 219**

- 1. Course Learning Outcomes.** From **Set Theory**: the notion of a set, operations in sets and compatibility relations between the various operations; The notion of a map including special maps such as identity, constant, inclusion, injective, surjective and bijective maps. The set \mathbf{N} of natural numbers and the theorem of induction in \mathbf{N} .
2. From **Algebra**: Group, ring and field structures.
3. **Linear Algebra**: The notion of a vector space structure; linear transformations; substructures; kernels and images of linear transformations $T : U \rightarrow V$ of vector spaces; sets of generators and the notion of a basis. The notion of dimension and the theorem of invariance of dimension. The universal property of vector spaces. The matrix of a linear transformation and general solutions of systems of equations.

Special emphasis is placed on proving theorems.

- 2. Resources Available to Students.** Recommended Text-books:

1. C. W. Curtis, Linear Algebra.
2. S. Lang, Linear Algebra.

- 3. Grading Criteria**: Two quizzes during the semester each carrying 25% of the final grade and a final exam carrying 50% of the final grade.

4. **Schedule**: Students are provided with complete lecture notes.