# Course Specification

**University/Academy:** Damanhour University  
**Faculty/Institute:** Science  
**Department:** Mathematics

## 1. Course Data:

<table>
<thead>
<tr>
<th>Course code:</th>
<th>Course title:</th>
<th>Academic year/level:</th>
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<tbody>
<tr>
<td>Math422</td>
<td>Mathematical Logic and Topology</td>
<td>2010-2011</td>
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<tr>
<th>Specialization:</th>
<th>No. of instructional units:</th>
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<tbody>
<tr>
<td>Mathematics and Physics</td>
<td>Lecture 4 tutorial 2 practical -</td>
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## 2. Course Aim

Demonstrate theoretical knowledge and have practical skills in the subjects of Mathematical Logic and Topology; Demonstrate an ability to initiate and sustain in-depth research relevant to Mathematical Logic and Topology; Have an opportunity to put theory into practice via work-based learning the applications of abstract mathematical Logic and Topology to the scientific discipline such as physics and chemistry.

## 3. Intended Learning Outcome

### a) Knowledge and Understanding

- a1. Mention theories and concepts used in Mathematical Logic and Topology.
- a2. Identify the steps required to carry out a piece of research on a topic within Mathematical Logic and Topology.
- a3. Recognize the contribution and impacts of Mathematical Logic and Topology in real-life problems.

### b) Intellectual Skills

- b1. Apply appropriate theories, principles and concepts relevant to the Mathematical Logic and Topology.
- b2. Formulate a reasoned argument from a variety of sources relevant to Mathematical Logic and Topology.
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<tr>
<td><strong>b3.</strong></td>
<td>Analyze and interpret information from a variety of sources relevant to Mathematical Logic and Topology.</td>
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<td><strong>b4.</strong></td>
<td>Select a reasoned argument to the solution of familiar and unfamiliar problems relevant to Mathematical Logic and Topology.</td>
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<td><strong>c) Professional skills</strong></td>
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<td><strong>c1.</strong></td>
<td>Plan practical activities using techniques and procedures appropriate to Mathematical Logic and Topology.</td>
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<td><strong>c2.</strong></td>
<td>Design a piece of independent research using Mathematical Logic and Topology techniques.</td>
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<td><strong>d) General skills</strong></td>
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<tr>
<td><strong>d1.</strong></td>
<td>Think independently, set tasks and solve problems on ethical scientific basis relevant to mathematical Logic and Topology.</td>
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<td><strong>d2.</strong></td>
<td>Communicate with others positively as part of a group, involving leadership, group dynamics and interpersonal skills such as listening, negotiation and persuasion relevant to Mathematical Logic and Topology.</td>
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<td><strong>d3.</strong></td>
<td>Use information and communication technology to discuss problems relevant to Mathematical Logic and Topology.</td>
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<td><strong>4. course content</strong></td>
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<tr>
<td></td>
<td>Logical connectives and truth tables. Validity, equivalence and Consequence.</td>
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<td>Propositional calculus. Deduction and equivalent theorems.</td>
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<tr>
<td></td>
<td>Consistency and completeness of propositional calculus.</td>
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<tr>
<td></td>
<td>Predicate calculus. Deduction and equivalent theorems.</td>
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<td></td>
<td>Reduced and normal forms in predicate calculus.</td>
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<td>Metric Spaces.</td>
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<td>Topological Spaces.</td>
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<tr>
<td><strong>5. Teaching and learning methods</strong></td>
<td>Hausdorff Spaces.</td>
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<td>Identification Maps and Quotient Topologies.</td>
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<td>Connected Topological Spaces.</td>
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<td>Homomorphisms.</td>
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<td><strong>6. teaching and learning methods for students with special needs</strong></td>
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### 7. Student Assessment

**a. Procedures used:**

- Final exam

**b. Schedule:**

- Assessment 1 Final exam Week 15

**c. Weighing of Assessment:**

- Final exam 200 Marks

### 8. List of Textbooks and References:

**a. Course Notes**

- Course notes provided by the staff member of Math department, to be handed at the beginning of the semester.
b. **Required Books (Textbooks)**

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<tr>
<td>2-</td>
<td>David R. Wilkins, “General Topology” Springer Virlag, 1996.</td>
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1- **Recommended Books**

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2- **Periodicals, web sites,…,etc**

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**Course Instructor:** Dr. Ragab Omar Abd El-Rahman

**Head of Department:** Dr. Ragab Omar Abd El-Rahman

**Date:** / /