**Course Specification**

**(CS 221 Logic Design)**

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| *University:* | Helwan University |
| *Faculty:* | Faculty of Computers & Information |
| *Department:* | ***Computer science*** |

**1. Course Data**

|  |  |
| --- | --- |
| **Code:** | CS 221 |
| **Course title:** | | Logic Design |
| **Level:** | 1 |
| **Specialization:** | Computer Science |
| **Credit hours:** | 3 hours |
| **Number of learning units (hours):** | (3) theoretical (2) practical |

**2. Course Objective**

Basic logic concepts: Logic states, number systems, Boolean algebra, basic logical operations, gates and truth tables. Combinational logic: Minimization techniques, multiplexers and de-multiplexers, encoders, decoders, adders and sub tractors, comparators, programmable logic arrays and memories, design with MSI, logic families, tri-state devices. Sequential logic: Flip flops, mono-stable multi-vibrators, latches and registers. , Counters.

**3. Intended Learning Outcomes of Course (ILOs)**

* **Knowledge and Understanding:**

A12. Demonstrate the basics of Computer Components.

A23. Recognize the logic of Digital Circuits.

**B- Intellectual Skills**

B3. Develop Analytical Skills.

B8. Gather and assess relevant information, using abstract ideas to interpret it effectively.

B10. Distinguish Diagnosis Techniques.

**C- Professional and Practical Skills**

**D- General and Transferable Skills**

D3. Use different Problem Solving techniques.

D7. Use Effective reasoning in problem solving.

**4. Course contents**

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **No. of hours** | **Lecture** | **Tutorial/ Practical** |
| Combinational Logical Design | 12 | 6 | 6 |
| Sequential Circuits | 18 | 9 | 9 |
| Registers and Counters | 18 | 9 | 9 |
| Memory and Programmable Logic Devices | 18 | 9 | 9 |
| Combinational Logical Design | 12 | 6 | 6 |
| Sequential Circuits | 18 | 9 | 9 |
| Registers and Counters | 18 | 9 | 9 |
| Memory and Programmable Logic Devices | 18 | 9 | 9 |
| Combinational Logical Design | 12 | 6 | 6 |
| Sequential Circuits | 18 | 9 | 9 |
| Registers and Counters | 18 | 9 | 9 |

**Mapping contents to ILOs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Topic | Intended Learning Outcomes (ILOs) | | | |
| Knowledge and understanding | Intellectual Skills | Professional and practical skills | General and Transferable skills |
| Combinational Logical Design | A12 | B10,B3 |  | D7,D3 |
| Sequential Circuits | A12 | B10,B8 |  | D3 |
| Registers and Counters | A23 | B10 |  |  |
| Memory and Programmable Logic Devices | A12,A23 | B10 |  | D7 |

**5. Teaching and Learning Methods**

Class Lectures

Workshop for computer H/W

**6. Teaching and Learning Methods for students with limited capability**

Using data show

e-learning management tools

**7. Students Evaluation**

**a) Used Methods**

Final Exam

Assignments

**b) Time**

Assessment 1: Test1 Week 4

Assessment 2: Test 2 Week 7

Assessment 3: Midterm exam Week 10

Assessment 5: final written exam Week 16

**c) Grades Distribution**

Mid-Term Examination 20%

Final-term Examination 60%

Other types of assessment 20 %

Total 100%

Any formative only assessments

**List of Books and References**

**a) Notes**

Course Notes

- Handouts

**b) Mandatory Books**

**Title:** Logical and Computer Design Fundamentals

**Author(s):** [MHYPERLINK "http://www.amazon.com/exec/obidos/search-handle-url/102-7726513-4739342?\_encoding=UTF8&search-type=ss&index=books&field-author=Mark%20Minasi".](http://www.amazon.com/exec/obidos/search-handle-url/102-7726513-4739342?_encoding=UTF8&search-type=ss&index=books&field-author=Mark%20Minasi) Morris Mano, C. R. Kim

**Publisher:** Prentice Hall

**c) Suggested Books**

**d) Other publications**

**Course Coordinator:**  Prof. Dr. Mostafa Sami

**Chairman of the Department:** Prof. Dr. Iraqy Khalifa