1. **Basic Information**

Program Title	Biomedical Engineering
Department offering the Program	Biomedical Engineering
Department Responsible for the Course	Computers Engineering & Automatic Control
Course Code	CSE151
Year/ Level	Level 100
Specialization	Minor
Requirements	CSE051
Authorization data of course specification	

Teaching Hours	Credit	Lectures	Tutorial	Practical
	3	2	1	1.5

2. Course Aims:

No.	Aims
1	Apply the knowledge engineering science in digital system design.
4	Use digital electronic circuits in digital biomedical systems.

3. Intended Learning Outcomes (ILOs):

a. Knowledge and Understanding:

No.	Knowledge and Understanding
A2	Apply basics of information technology (IT).

b. Intellectual Skills

No.	Intellectual Skills
B3	Think in a creative and innovative way in design digital logic circuit.
B7	Solve digital design engineering problems, often on the basis of limited and possibly contradicting information.
B8	Select the appropriate IT tools to digital design engineering problems.
B12	Create systematic and methodic approaches when dealing with new and advanced digital design technology for biomedical applications.
B17	Distinguish the main characteristics of the digital design contributing to the optimal biomedical engineering systems.

c. Professional Skills

No.	Professional Skills
C1	Apply knowledge of science, information technology, design, and engineering practice integrally to solve digital engineering problems.
C5	Use computational facilities and laboratory equipment to design combinational and sequential circuits.

d. General Skills

No.	General Skills
D4	Demonstrate efficient IT capabilities.

4. Course Contents:

No.	Topics	Week
1	Numeric Systems *Experimental:* Converting between binary, decimal, octal and	1-2

	hexadecimal numbers.	
2	Boolean algebra	3-4
3	Logic gates *Experimental:* Using the kit and test the output on simple circuits.	5-6
4	Boolean function reduction	7,9
5	Combinational circuits *Experimental:* Implement of digital clock using counters.	10-11
6	Sequential circuits	12
7	Introduction to Digital integrated circuits *Experimental:* Implementation simple electronics circuits.	13
8	Synchronized sequential components *Experimental:* Storing some binary values in flip flops types.	14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Lectures
2	Discussion Sessions
3	Practical

6 Teaching and Learning Methods for Disable Students:

No.	Teaching Method	Reason
1	Extra and more simple lectures	To increase their skills

7. Student Evaluation:
7.1 Student Evaluation Methods:

No.	Evaluation Method	ILOs
1	Mid Term Examination	A2– B8
2	Oral Examination	B3
3	Practical Examination	C5
4	Semester work	B3,B8,C1,D4
5	Final Term Examination	A2,B3,B7, B8,B12,B17

7.2 Evaluation Schedule:

No.	Evaluation Method	Weeks
1	Mid Term Examination	8
2	Oral Examination	13
3	Practical Examination	13
4	Semester work	Every week
5	Final Term Examination	15

7.3 Weighting of Evaluations:

No.	Evaluation Method	Weights
1	Mid Term Examination	15%
2	Oral Examination	10%
3	Practical Examination	15%
4	Semester work	10%
5	Final Term Examination	50%
Total		100%

8. List of References

No.	Reference List
1	M.Mano, "Computer systems design," 6th edition 2011
2	Harris, David M., and Sarah L. Harris. Digital design and computer architecture. Waltham, MA: Morgan Kaufmann, 2013.

3	Roth, Charles H., and Larry L. Kinney. Fundamentals of logic design. Stamford, CT: Cengage Learning, 2014.
4	Lecture on digital systems design (Class notes)

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Sound System
5	Wireless Internet
6	Lab Facilities
7	Visualizer

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	Aims	Knowledge &Understanding	Intellectual Skills	Professional Skills	General Skills
1	Numeric Systems	1	A2			
2	Boolean algebra	1	A2		C1	
3	Logic gates	1	A2	B8	C5	
4	Boolean function reduction	1	A2	B3		D4
5	Combinational circuits	4	A2		C1	D4
6	Sequential circuits	1,4	A2		C5	D4
7	Introduction to Digital integrated circuits	1	A2	B8, B12		D4
8	Synchronized sequential components	1, 4	A2	B3,B7,B17	C5	D4

Course Coordinator: Prof.Dr.
Head of Department: Assoc. Prof. Hossam Eldeen Salah
Date of Approval;