Green University of Bangladesh (GUB)
Dept. of Computer Science and Engineering

COURSE OUTLINE

1	**Faculty**	Faculty of Science and Engineering (FSE)
2	**Department**	CSE
3	**Programme**	B.Sc in CSE
4	**Name of Course**	Electronic Devices and Circuits & Pulse Techniques
5	**Course Code**	EEE 203
6	**Trimester**	Fall, 2021
7	**Pre-requisites**	EEE 201 (CSE)
8	**Status**	Other Engineering Course
9	**Credit Hours**	3
10	**Section**	201 DH, 202 DA, 202 DB
11	**Class Hours**	

Section	Class Day	Class Hours	Venue
201 DH	Tuesday	03:00-04:30 PM	Zoom
	Thursday	08:30-10:00 AM	Zoom
202 DA	Tuesday	01:30-03:00 PM	Zoom
	Thursday	01:30-03:00 PM	Zoom
202 DB	Tuesday	11:30 AM-1:00 PM	Zoom
	Thursday	11:30 AM-1:00 PM	Zoom

12	**Class Location**	Online
13	**Course website**	https://classroom.google.com/u/1/c/NDA2MDAyOTUzODEz [201DH] https://classroom.google.com/u/1/c/NDA2MDAyOTUzNzgz [202 DA] https://classroom.google.com/u/1/c/NDA2MDAyOTUzODAw [202 DB]
14	**Instructor**	Israt Jahan
15	**Contact**	jahan@eee.green.edu.bd
16	**Office**	Desk-15, Room No: B-607
17	**Counselling Hours**	

Day	Counseling Hours	Venue
Sunday	11.30 AM- 1.00 PM	online

18	**Text Books**	1. Sedra A. S., Smith K. C., Microelectronic Circuits, fifth edition, Oxford university press 2. Coughlin, R. F., & Driscoll, F. F. (1987). Operational amplifiers and linear integrated circuits. Prentice-Hall, Inc. 3. Alexander C. K., Sadiku M. N. O., Fundamentals of Electric Circuits, fourth edition, McGraw-Hill.
19	**Reference Books**	1. Millman, J., Halkias C. & Parikh C. D., Integrated Electronics: Analog and Digital circuits and systems, 2nd edition, McGraw-Hill. 2. Robert L. Boylestad & Louis Nashelsky. Electronic Devices and Circuit Theory. Prentice-Hall, Inc.
20	**Equipment & Aids**	Bring your own materials *(calculator,pen, paper, etc.)* to participate effectively in
		classroom activities. Besides class note, please keep at least one blank A4 size paper per class with you.
21	**Course Rationale**	This course will allow the students to learn about different types of electronic devices and circuits and their applications.
22	**Course Description**	Diode logic gates, transistor switches, transistor gates, MOS gates; Analog switches. Linear wave shaping: diode wave shaping techniques, clipping and clamping circuits, comparator circuits, switching circuits; Electronic circuits for flip-flops, counters and register, memory systems, PLA's; A/D and D/A converters with applications; Logic Families: TTL, ECL, IIL and CMOS logic with operation details; Propagation delay, product and noise immunity; Open collector and high impedance gates; S/H circuits, LED, LCD and optically coupled oscillators; Nonlinear applications of OP AMPs; Pulse transformers, pulse transmission, pulse generation; monostable, bi-stable and stable multi-vibrators, Schmitt trigger, blocking oscillators and time-base circuit; Timing circuits; Simple voltage sweeps, linear current sweeps. Device Problems including BJT, FET, MOSFETS, CMOS, TUBES, Digital interfaces including D/A, A/D, S/H. Digital Filters, Modern Sampling Techniques.
23	**Course Outcomes (CO)**	After completing this course students will be able to **CO1:** Solve mathematical problems of various electronic components like diodes, BJTs, FET, MOSFETs, OP-AMPs etc. [Cognitive] **CO2:** Describe the operation of various A/D and D/A converters, various pulse generating circuits with 555 timer IC**,** LED, LCD and PLA's. [Cognitive] **CO3:** Design various logic gates using CMOS technology, digital filters, TTL and ECL. [Affective]

24	**Teaching Methods**	Maximum topics will be covered from the textbook. For the rest of the topics, reference books will be followed. White board will be used for most of the time. For some cases, multimedia projector will be used for the convenience of the students. Students must participate in classroom discussions for case studies, problems solving and project developments.

25 Topic Outline

All topics and problems are from the main text if not specified otherwise.

Lecture	Selected Topics	Article (Text)	Suggested Problems. (Text)	Outcome
(1)	Introduction to the course	-	-	
(2-4)	Diode circuit models Solving mathematical problems with diode circuit models Diode Wave shaping (Clipping & Clamping) Diode logic gates	3.1, 3.3 (Text 1) 2.5 - 2.9 (Ref 2)	Related examples and problems from the book.	CO1, CO2
(5-6)	Introduction to OP-AMPs Non-linear applications of OP AMPs Inverting and non-inverting Schmitt trigger circuit Solving problems	2.1 - 2.5 (Text 2)	Related examples and problems from the book.	CO1, CO2
(7-8)	Introduction to flip-flops, counters and register, memory systems Electronic circuits solving Propagation delay, product and noise immunity Solving mathematical problems	5.3 – 5.5 (Text 3)		CO1
(9-10)	Introduction to PLA's, Comparator circuits, A/D and D/A converters Logic Families: TTL, ECL and Monostable, bistable and stable multi-vibrators	5.6, 5.7, 6.6.1, 6.6.2 (Text 3) 16.15 (Ref 1)	Related examples and problems from the book.	CO1, CO3
(11-12)	Analog multiplier Digital Filters Pulse transformers, pulse transmission, pulse generation Review on the topics covered before the mid-term examination.	4.2 – 4.4 (Text 2)	Related examples and problems from the book.	CO1, CO2
(13-	Introduction to FET & MOSFETs			

17)	Basic operation of MOSFETs Current voltage characteristics of MOSFET CMOS technology Logic circuit design with CMOS technology	4.1, 4.3, 4.10.3, 10.3 (Text 1)	Related examples and problems from the book.	CO2, CO3
(18-20)	Introduction to Bipolar Junction Transistors (BJT) Operating modes of BJTs BJT as a switch LED, LCD and optically coupled oscillators	5.3.4, 5.4, 5.5 (Text 1)	Related examples and problems from the book.	CO2
(21-23)	Introduction to timing circuits Introduction to 555 timer IC 555 timer IC internal circuit blocks Simple voltage sweeps, linear current sweeps Open collector and high impedance gates	9.8.1, 9.8.2, 9.9.2 (Text 1) 13.1-13.3, 13.5-1 (Text 2)	Related examples and problems from the book.	CO3
(24)	Review on the topics covered before the final examination.			

26 Assessment and Marks Distribution:

Students will be assessed on the basis of their overall performance in all the exams, quizzes, and class participation. Final numeric reward will be the compilation of (tentative):

- Class Tests (15%)
- Assignment (5 %)
- Presentation (5 %)
- Attendance and Performance (5 %)
- Mid-Term Test (30%)
- Final Exam (40%)

27 Assessment Methods of COs

Assessment methods of COs are given below:

	Assessment						
COs	**CT1**	**CT2**	**CT3**	**MT**	**FE**	**Assignment**	**Presentation**
CO1	√			√	√		√
CO2		√		√	√		
CO3			√		√	√	

28 Mapping of COs with POs

Mapping of COs with pro gram outcomes (POs) are given below:

	Program Outcomes (POs)											
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	√											
CO2		√										

		CO3								√			

29 **Grading Policy**

The following chart will be followed for grading. This has been customized from the guideline provided by the School of Engineering and Computer Science.

A+	**A**	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**D**	**F**
80 and above	**75-<80**	**70-<75**	**65-<70**	**60-<65**	**55-<60**	**50-<55**	**45-<50**	**40-<45**	**<40**

29 **Additional Course Policies**

Assignments There will be one assignment. Marks of the assignment will be counted. No late homework will be accepted.

Any kind of copy in assignment will carry zero mark.

Two or more copied assignments will carry zero mark in all assignments. Zero tolerance will be shown in this regard.

Solutions to assignment problems will be provided on hand.

Class Test There will be at least three CTs, best of two will be counted. A CT can be taken with an announcement in prior or without any announcement.

Exams Mid-term and final exam will be closed book, closed notes. Cell phone is strictly prohibited in exam hall. Please bring your own watch and synchronize time during exam hours.

Test Policy: If you are absent from a test, and you have not spoken to the teacher personally beforehand, your grade for the test will be zero. No make-up for class test will be taken because it has alternative (three out of four). No make-up for mid will be entertained without presence and recommendation of guardian and written permission of the department. Make-up test of mid will be much harder than the regular test.

30 **Additional Information**

a. Academic Calendar Fall 2019: http://www.green.edu.bd/academics/academic-calendar.
b. Academic Information and Policies: http://www.green.edu.bd/academics/academic-rules-a-regulations.
c. Grading and Performance Evaluation: http://www.green.edu.bd/academics/academic-rules-a-regulations.
d. Proctorial Rules: http://www.green.edu.bd/administrator/proctors-office.