DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO.ACAD/NP/B.Sc.-Ist Yr./SEM.-I & II/157/2013

It is hereby notified for information of all concerned that, on the recommendations of the Boards of Studies, Ad-hoc Boards, and Faculty of Science, the **Academic Council at its meeting held on 25-03-2013 has accepted the following revised syllabi for B.Sc. First Year progressively under the Faculty of Science** :-

Sr. No.	*Revised Syllabus*	
[1]	***B.Sc. [Physics]***	***Semester- I & II,***
[2]	***B.Sc. [Dairy Science & Technology]***	***Semester- I & II,***
[3]	***B.Sc. [Industrial Chemistry]***	***Semester- I & II,***
[4]	***B.Sc. [Geology]***	***Semester- I & II,***
[5]	***B.Sc. [Chemistry]***	***Semester- I & II,***
[6]	***B.Sc. [Botany]***	***Semester- I & II,***
[7]	***B.Sc. [Electronics] Science***	***Semester- I & II,***
[8]	***B.Sc. [Fisheries]***	***Semester- I & II,***
[9]	***B.Sc. [Microbiology]***	***Semester- I & II,***
[10]	***B.A. [Statistics]***	***Semester- I & II,***
[11]	***B.Sc. [Statistics]***	***Semester- I & II,***
[12]	***B.Sc. [Zoology]***	***Semester- I & II,***
[13]	***B.Sc. [Textile and Interior Decoration]***	***Semester- I & II,***
[14]	***B.Sc. [Home Science]***	***Semester- I & II,***
[15]	***B.A. / B.Sc. [Mathematics]***	***Semester- I & II.***

This is effective from the **Academic Year 2013-2014** and onwards.

These **syllabi are available on the University Website www.bamu.net**

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO.ACAD/NP/B.SC.-IST YEAR/
Sem-I & II/2013/5132-541
A.C.S.A.I.No.327[9].

Date:- 08-05-2013.

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Director,
Board of College and
University Development.

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Copy forwarded with compliments to :-

1] **The Principals, affiliated concerned Colleges,**
Dr. Babasaheb Ambedkar Marathwada University.

2] The Director, University Network & Information Centre, UNIC, with **a request to upload the above all syllabi on University Website [www.bamu.net].**

Copy to :-

1] The Controller of Examinations,

2] The Superintendent, [B.Sc. Unit],

3] The Superintendent, [B.A. Unit],

4] The Superintendent, [Eligibility Unit],

5] The Programmer [Computer Unit-1] Examinations,

6] The Programmer [Computer Unit-2] Examinations,

7] The Director, [E-Suvidha Kendra], in-front of Registrar's Quarter,
Dr. Babasaheb Ambedkar Marathwada University,

8] The Public Relation Officer,

9] The Record Keeper,
Dr. Babasaheb Ambedkar Marathwada University.

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S/-080513/-*

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD

SYLLABUS

of

B.Sc. FIRST & SECOND SEMESTER

[ELECTRONICS (OPTIONAL)]

{Effective from – June- 2013 onwards}

Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

B.Sc. Electronics (Optional) Course Structure in Semester System (I to VI SEMESTER) {Effective from June 2013}

B.Sc. First, Second & Third Year

Semester	Course Code	Paper Number	Title of Paper	Credits	Marks
I	ELE-101	Paper-I	Network Theorems & Semiconductor Devices	03	50
	ELE-102	Paper-II	Digital Electronics – I	03	50
	ELE-103	Paper-III	Practicals based on Paper – I & II	1.5	50
II	ELE-201	Paper- IV	Amplifiers	03	50
	ELE-202	Paper-V	Digital Electronics – II	03	50
	ELE-203	Paper-VI	Practicals based on Paper – III & IV	1.5	50

Note: (i) ***For Theory Papers, 1 Credit = 15 Periods***
For Practical Papers, 1 Credit = 30 Periods

(ii) In the examination the students will perform only ONE experiment from papers III and VI, carrying 100 marks. The distribution of 100 marks will be as follows:
Experiment: 80 marks
Project : 20 marks

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B. Sc. First Semester Subject: ELECTRONICS
Paper – I Course: ELE – 101
(effective from June 2013)

Paper – I (ELE – 101): Network Theorems and Semiconductor Devices
Marks: 50 Credits:03 Periods : 45

1. **Components and Network Theorems : (12)** [**0.8credits**]
   Active & passive elements, Resistors, Capacitors, Inductors, Transformers, Relays and Fuses { classification, specification & Applications},Voltage divider theorem, current divider theorem, ideal Constant voltage source, Ideal constant current source, superposition theorem, Thevenin's theorem, maximum power theorem,
2. **Diodes : (09)** [**0.6credits**]
   P-N junction Diode, Biasing a semiconductor diode, Static and Dynamic resistance of a diode, breakdown of PN junction, ideal diode, Special diodes (Zener diode, Tunnel diode, Varactor diode, Light Emitting diode and Photodiode)
3. **Transistors: (12)** [**0.8credits**]
   Transistor, transistor action, transistor symbols, transistor configurations, characteristics of transistor in common base, common emitter, common collector configurations, comparison of CE,CB and CC configuration, transistor current gains α and β, relation between α and β, Junction field effect transistor, Static characteristics of JFET, JFET characteristics with external bias, transfer characteristics, small signal JFET parameters, MOSFET.
4. **Power supplies: (12)** [**0.8credits**]
   Block diagram of Regulated Power Supply, Half wave rectifier, efficiency of HWR, Full wave rectifier, Bridge rectifier, efficiency of FWR, ripple factor, types of filter circuits, Zener diode as voltage regulator, transistor series voltage regulator, fixed positive linear regulators, fixed negative linear voltage regulators

Text Books:

1. Electrical Technology – B.L.Theraja (S. Chand 2004) (Chp.1)
2. Semiconductor Electronics – A.K.Sharma New age international 1996(Chp.2)
3. Principle of electronics – V.K.Mehta (S. Chand and Co. 2004) (Chp.2,3 and 4)
4. Basic Electronics (solid stste) – B L Theraja (S. Chand and Co. 2012) (Chp.1, 2,3 and 4)
5. Basic Electronics by Grobe

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B. Sc. First Semester Subject: ELECTRONICS
Paper – II Course: ELE – 102

(effective from June 2013)

Paper – II (ELE – 102): Digital Electronics – I

Marks: 50 Credits:03 Periods : 45

1. Number System: (15) [**1 credits**]

Number System: Decimal, Binary, Hexadecimal Number Systems and their inter conversions , Binary arithmetic (addition, subtraction, multiplication and division), 1's and 2's compliment method for binary subtraction, Hexadecimal addition and subtraction, Binary Codes (8421 (BCD) code, Gray code, Excess-3 code), BCD addition and subtraction, Excess-3 addition and subtraction, ASCII Code

2. Logic gates: (09) [**0.6credits**]

Positive and negative logic, Logic Gates (NOT gate, AND gate, OR gate, NAND gate, NOR gate) using diodes & transistors, Ex-OR gate, Ex-NOR gate,

3. Boolean algebra: (09) [**0.6 credits**]

Boolean Operations, Rules and laws of Boolean algebra, DeMorgan's theorems, minterms, maxterms, SOP and POS form of Boolean expressions, Simplification of Boolean Expressions, Karnaugh map [K-map] (up to four variables only)

4. Combinational logic circuits: (12) [**0.8 credits**]

NAND and NOR gate as universal building blocks, Half adder, Full adder, Half subtractor, full subtractor, 4 bit parallel adder and subtractor, 2's complement adder /subtractor, 3 bit binary decoder, decimal to BCD encoder, 8 to 1 multiplexer, 1 to 8 demultiplexer

Books Recommended:

1. Digital Fundamentals – Thomas L Floyd, Universal Book Stall New Delhi
2. Digital Electronics and Microcomputers – R.K.Gaur
3. Digital Analog Techniques – Navneth, Kale and Gokhale, Kitab Mahal
4. Digital Electronics with Practical Approach – G N Shinde, Shivani Publications Nanded
5. Digital Principles and Circuits – C B Agarwal, Himalaya Publishing House

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B. Sc. Second Semester Subject: ELECTRONICS
Paper – III Course: ELE – 201

(effective from June 2013)

Paper – III (ELE – 201): Amplifiers

Marks: 100 Credits:03 Periods : 45

1. **Bias for Transistor Amplifiers: (12)** [**0.8credits**]
   Transistor load line analysis, Operating point, Inherent variation of transistor parameters, Stabilisation, essentials of transistor biasing circuit, stability factor, methods of transistor biasing, base resistor method, voltage divider bias method.

2. **Small signal Amplifiers: (12)** [**0.8credits**]
   Two port network, h-parameter equivalent circuit, equivalent circuit for BJT, transconductance model, CE amplifier, CB amplifier, emitter follower circuit, equivalent circuit for JFET, Common Source amplifier, source follower amplifier
3. **Feedback Amplifier: (12)** [**0.8credits**]
   An amplifier black box with feedback, stabilization of gain by negative feedback, reduction of nonlinear distortion by negative feedback, , effect of feedback on output resistance, effect of feedback on input resistance, voltage series feedback,
4. **Multistage transistor amplifier: (09)** [**0.6credits**]
   Multistage transistor amplifier, important terms, RC coupled transistor amplifier, direct coupled amplifier

Text Books :

1. Electronics fundamentals and applications–J.D.Ryder,5th ed. (Chp. 1, 2 and 3)
2. Principle of electronics - V.K.Mehta (S Chand and co. 2004)(Chp.1 and 4)

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B.Sc. Second Semester Subject: ELECTRONICS
Paper – VI Course: ELE – 202

(effective from June 2013)

Paper – VI (ELE – 202): Digital Electronics – II
Marks: 100 Credits:03 Periods : 45

1. **Flip-Flops:** **(9 periods)** [**0.6 credits**]
   flip flops (SR, D, JK and T) [using gates], Methods of triggering flip flops, Edge triggered flip flops (SR, D, JK and T), Asynchronous inputs, Master slave JK flip flop, Operating characteristics
2. **Counters:** **(9 periods)** [**0.6 credits**]
   Concept of counter, Asynchronous Counters (three and four bit), Synchronous Counters (three and four bit), decade Counter (asynchronous), Up/Down Synchronous Counter (three bit only)
3. **Shift Registers:** **(9 periods)** [**0.6 credits**]
   Shift register functions, Serial In – Serial Out Shift Register, Serial In – Parallel Out Shift Register, Parallel In – Serial Out Shift Register, Parallel In – Parallel Out Shift Register, Bidirectional Shift Register, Ring Counter, Buffer Register
4. **Memories:** **(9 periods)** [**0.6 credits**]
   Memory Concept, Read Only Memory (ROM), Programmable ROMs (PROMs & EPROMs), Random Access (Read / Write) Memories (RAMs)
5. **D/A and A/D converters:** **(9 periods)** [**0.6 credits**]
   R-2R Ladder type D/A converter, DAC Characteristics (Monotonicity, Resolution, Accuracy and Setting Time), Successive approximation A/D converter, Dual slope A/D converter

Books Recommended:

1. Digital Fundamentals – Thomas L Floyd, Universal Book Stall New Delhi
2. Digital Electronics and Microcomputers – R K Gaur
3. Digital Analog Techniques – Navneeth, Kale and Gokhale, Kitab Mahal
6. Digital Electronics with Practical Approach – G N Shinde, Shivani Publications Nanded
7. Digital Principles and Circuits – C B Agarwal, Himalaya Publishing House

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B. Sc. First Semester Subject: ELECTRONICS
Paper – V Course: ELE – 103
(effective from June 2013)

Paper – V (ELE – 103): Experiments based on paper I & II
Marks: 50 Credits: 1.5

Every candidate appearing for examination must produce journal showing that he/she has completed 06 experiments during academic year. The journal must be certified at the end of the year by Head of the Department.

1. Study of PN junction diode characteristics, determination of ac and dc resistance
2. Study of zener diode characteristics, determination of V_Z, I_Z, Z_Z.
3. Study of transistor characteristics in CE configuration, determination of α.
4. Study of JFET characteristics, determination of parameters.
5. Built and study of Full wave rectifier
6. Built and study shunt regulator using zener diode, line and load regulation
7. Built and study power supply with capacitor filter
8. Built and Built and study NOT, OR, & AND gates using Diodes and Transistor/ 74XX.
9. Built and Built and study NAND & NOR gates using Diodes and Transistor/ 74XX.
10. Built and Built and study basic gates using NAND/ NOR gates.
11. Built and study of Half adder using gates.
12. Built and study of Half subtractor using gates.

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B. Sc. Second Semester Subject: ELECTRONICS

Paper – VI Course: ELE – 204

(effective from June 2013)

Paper – VI (ELE – 203): Experiments based on paper II & IV
Marks: 50 Credits: 1.5

Every candidate appearing for examination must produce journal showing that he/she has completed 04 experiments during academic year. The journal must be certified at the end of the year by Head of the Department.

1. Built and study CE amplifier, plot the frequency response curve and find 3 dB bandwidth
2. Built and study common source FET amplifier, plot the frequency response curve and find 3 dB bandwidth
3. Built and study current series feedback amplifier, plot frequency response curve with and without feedback
4. Built and study two stage RC coupled CE amplifier, plot the frequency response curve and find 3 dB bandwidth
5. Built and study JK, T and D- Flip-Flops using IC 7476
6. Built and study 4-bit binary parallel adder / subtractor using IC 7483
7. Built and study MOD 16 Asynchronous binary UP counter
8. Built and study binary decade counter IC 7490
9. Built and study D/A converter using R-2R ladder network

The students should built a mini project and submit it at the time of examination along with project report. The project will carry 20 marks in the examination.

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