# Maharashtra State Board of Technical Education, Mumbai TEACHING PLAN (TP)

**D-1**

## Academic Year: 2020-21

**Date:** 15/06/2020

**Institute Name &Code:** Late Annasheb polytechnic (NIT’s), Nashik (1479)

**Programme and Code**: Electronics & Telecommunication Engineering **Course Index:** 302

**Course Name**: Applied Electronics **Course Abbr -Code**: AEL -22329

**Semester**: III rd **Scheme**: ‘I’ **Allocated Hrs:** 64 **Faculty**: Mrs.S.K.Khaire

# Class: SYEJ

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## Course Objectives:

* 1. Use transistor as low power amplifier.
  2. Use BJT as high power amplifier.
  3. Use BJT as feedback amplifier
  4. Use BJT as waveform generator.
  5. Maintain IC Voltage regulator & SMPS.

## Course Outcomes (COs) and Unit Outcomes: Theory & Practical

By learning course Data Communication & Computer Network (DCC-22414), Second Year students will be able to:

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| **CO No.** | **UO No.** | **Course Outcomes (COs) / Unit Outcomes (UOs)** |
| **CO302.1** |  | **Low Power Amplifier.** |
|  | 1a | Explain with sketches the working principle of given type amplifiers. |
| 1b | Calculate gain & bandwidth of given low power amplifier |
| 1c | Compare performance parameter of given types of amplifier coupling |
| 1d | State relevant tuned amplifier for the given frequency band with justification |
| 1e | Describe the environment employed for the given simulation work with  justification. |
| **CO302.2** |  | **High Power Amplifier.** |
|  | 2a | Explain with sketches the working of given type of power amplifier |
| 2b | Select the relevant power amplifier for the given application with justification |
| 2c | Calculate the efficiency of given power amplifier |
| 2d | Compare the performance parameters of the given types of power amplifiers |
| 2e | Prepare the specification of the given type amplifier |
| **CO302.3** |  | **Feedback Amplifier.** |
|  | 3a | Calculate the gain of the amplifier for given type of feedback amplifier |
| 3b | Explain effect of negative feedback on the given type of amplifier performance |
| 3c | Calculate gain , bandwidth , input & output resistance of the given feedback  amplifier |
| 3d | Compare the performance of given type of negative feedback amplifier |
| **CO302.4** |  | **Waveform Generator.** |
|  | 4a | Calculate frequency of oscillation of given type of oscillator circuit |
| 4b | Select the relevant oscillator to obtain the given range of frequency with justification |
| 4c | Choose the relevant sweep generator to obtain the specified saw tooth waveform  with justification |

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|  | 4d | Prepare the specification of given oscillator |
| **CO302.5** |  | **IC Voltage Regulator & SMPS.** |
|  | 5a | Explain with sketches the working principle of given type of voltage regulator IC |
| 5b | Compare the working of the give types of regulators |
| 5c | Design voltage regulators for the specified output voltage |
| 5d | Interpret the working of given block of SMPS |

* Teaching Plan:

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| **Unit No.**  **(Allotted Hrs.)** | **Unit**  **Objectives** | **Title/Topic Details and Course Outcome (CO)** | **Plan (From - To**  **& No. of**  **Lectures)** | **Actual Execution (From-To & No. of Lectures)** | **Teaching Method/ Media/ Tools** | **Remark** |
| **01.**  **(14)** | 1a, 1b | * 1. Single Stage Amplifiers      1. Clarification of amplifiers      2. BJT as an amplifier.   **1.2** Single stage CE amplifier , frequency response , gain , bandwidth | 15/06/2020  to 19/06/2020 (04) |  | Online teaching on zoom, Google class  etc. PPT & Videos |  |
| 1a,1b,  1c,1d, 1e | * 1. Multistage Amplifier concept   2. Multistage amplifier BJT based classification      1. Types of BJT amplifier - RC Coupled amplifier diagram , operation , frequency response & application      2. Transformer coupled amplifier diagram , operation , frequency response & application      3. Direct coupled amplifier diagram , operation , frequency response & application      4. Comparison all coupled amplifiers      5. Numerical on amplifiers | 20/06/2020  to 25/06/2020 (05) |  | Online teaching on zoom, Google class  etc. PPT & Videos |  |
| 1a,1b, 1c | * 1. FET amplifier      1. Common Source amplifier , working principle & application | 27/06/2020  to 29/06/2020 (02) |  | Online teaching on zoom, Google class  etc. PPT & Videos |  |
| 1d,1e | * 1. Tuned Amplifier      1. Need of tuned amplifier      2. Single tuned amplifier circuit , operating principles & frequency responses      3. Double tuned Amplifier circuit , operating principles & frequency responses      4. Stagger tuned amplifier amplifier circuit , operating principles & frequency responses      5. Comparison between tuned amplifier | 30/06/2020  to 02/07/2020 (03) |  | Online teaching on zoom, Google class  etc. PPT & Videos |  |
|  | 2a,2b | * 1. Power amplifier :      1. Comparison between small signal amplifier & large signal amplifier, | 03/07/2020  to 11/07/2020 |  | Online teaching on  zoom, Google |  |

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| **02.**  **(18)** |  | **2.1.2** Performance parameter of power amplifier like bandwidth, gain, frequency response & efficiency. | (06) |  | class etc. PPT &  Videos |  |
| 2b | **2.2** Classification of large signal amplifier  :Class A , Class B , Class AB & Class C | 13/07/2020  to 23/07/2020 (08) |  | Online teaching on zoom, Google class  etc. PPT & Videos |  |
| 2b,2c, 2d,2e | * 1. Class A , Class B , Class AB & Class C amplifier Circuit , operation , input output waveforms , efficiency and power equation of single stage      1. Compassion between all power amplifier      2. Specification of large signal amplifier | 25/07/2020  to 30/07/2020 (04) |  | Online teaching on zoom, Google class  etc. PPT & Videos |  |
| **03.**  **(12)** | 3a,3b, 3c | * 1. Principle of feedback amplifier   2. Types of feedback      1. Negative feedback amplifier details      2. Positive feedback amplifier details | 01/08/2020  to 05/08/2020 (04) |  | Online teaching on zoom, Google class  etc. PPT & Videos |  |
| 3b,3c, 3d | * 1. Feedback amplifier connection      1. Voltage series -block diagram , circuit & operation      2. Voltage shunt block diagram , circuit & operation      3. Current series block diagram , circuit & operation      4. Current shunt block diagram , circuit & operation | 06/08/2020  to 17/08/2020 (08) |  | Online teaching on zoom, Google class  etc. PPT & Videos |  |
| **04.**  **(12)** | 4a, 4b | * 1. Oscillator      1. Need of oscillator      2. Comparison of amplifier & oscillator | 18/08/2020  to  20/08/2020 (03) |  | Online teaching on zoom, Google class  etc. PPT & Videos |  |
| **4.2** Condition for oscillation  **4..2.1** Barkhausen’s criteria  **4.2.2** Classification of oscillators | 22/08/2020  to  24/08/2020 (02) |  |

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|  | 4a,4b, 4d | * 1. **Sine wave oscillator**      1. RC phase shift oscillator working principle & circuit      2. LC oscillators working principle & circuit      3. Crystal oscillator working principle & circuit | 25/08/2020  to 29/08/2020 (04) |  | Online teaching on zoom, Google class  etc. PPT & Videos |  |
| 4c | * 1. Sweep generator      1. Concept of sweep generator & it’s classification      2. Details of miller sweep generator      3. Details of bootstrap circuit      4. Details of current time base generator. | 01/09/2020  to 05/09/2020 (03) |  | Online teaching on zoom, Google class  etc. PPT & Videos |  |
| **05.**  **(08)** | 5a,5b, 5c | * 1. Voltage regulators      1. Concept of voltage regulators      2. Classification of voltage regulators      3. Positive fixed voltage regulator - IC 78XX      4. Negative fixed voltage regulator - IC 79XX      5. Specification & details of variable voltage regulator IC 723      6. Specification & details of variable voltage regulator IC 317 | 07/09/2020  to 14/09/2020 (06) |  | Online teaching on zoom, Google class  etc. PPT & Videos |  |
| 5d | * 1. SMPS      1. SMPS working principle , specifications , advantages , disadvantages with application   **5.2.3** Need of heat sink | 15/09/2020  to 17/09/2020 (02) |  | Online teaching on zoom, Google class  etc. PPT & Videos |  |
|  |  | **Total** | 64 |  |  |  |

### Chapter wise CO Mapping:

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|  | **CO302.1** | **CO302.2** | **CO302.3** | **CO302.4** | **CO302.5** |
| **Chapter 1** |  |  |  |  |  |
| **Chapter 2** |  |  |  |  |  |
| **Chapter 3** |  |  |  |  |  |
| **Chapter 4** |  |  |  |  |  |
| **Chapter 5** |  |  |  |  |  |

* **Direct Assessment Criteria:**
  + **Rules for Theory Assessment:**

1. Weekly Test may be conducted in class. Student can’t access any study material during test.
2. An Open Book Test may be conducted in class. Student can access any material but no discussion with any one is allowed during test.
3. Total weightage of Theory Marks to the Course is 100. From 100 Marks 70 Marks are allotted to MSBTE TH Examination and 30 Marks are allotted to Theory Progressive Assessment (PA).
4. Under the theory PA; out of 30 Marks, 10 marks of theory PA are for micro-project assessment to facilitate integration of COs and the remaining 20 marks is the average of 2 test taken during the semester
5. MSBTE Theory Examination of 70 marks will be conducted by MSBTE at the end of semester. The schedule of MSBTE Examinations will be announced by MSBTE on the website [www.msbte.com.](http://www.msbte.com/)

### Rules for Practical assessment:

* 1. Progressive Assessment (P.A.) of each experiment will be done out of 25 marks on the basis of Use of appropriate tool to solve the problem, Quality of output achieved, Answer to sample questions and Submit report in time
  2. Final term work of 50 marks is calculated based on Progressive Assessment for each experiment
  3. Term Work Marks = ((Total Marks Obtained in P.A.) / (25 x Total Number of Experiments)) \*25
  4. A comprehensive Final Practical End Semester examination (of 25 Marks) will be conducted by MSBTE at the end of semester. Examiner for this examination will be appointed by MSBTE. The schedule of MSBTE Practical Examination will be display on Notice board prior to examination

### References:

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| --- | --- | --- | --- |
| **Sr. No** | **Author** | **Title** | **Publisher** |
| 01 | Applied Electronics | Sedha R.S. | S .Chand New Delhi , 2015 ISBN:9788121927833 |
| 02 | Principle Of Electronics | Mehta V.K.  Mehta Rohit | S .Chand New Delhi , 2014 ISBN:8121924502 |
| 03 | Electronics Devices & Circuit Theory | Boylestend , Roberrt , Neshelsky, Louis | Pearson Education , New Delhi  , 2014, ISBN: 9780132622264 |
| 04 | Fundamentals Of Electronics Devices and Circuits | Bell | Oxford University Press , New Delhi ,2015 ISBN-  9780195425329 |
| 05 | Electric Devices & Circuits | Millman , Jacob, Halkias , C.Christos Jit, Satyabrata | Me Graw Hill Education , New Delhi , 2015 , ISBN : 9789339219550 |
| 06 | Modern Power Electronics | Sen P.C. | S .Chand New Delhi , 2015 ISBN:9788121924252 |

* **Web References:**

1. [www.eng.uokufa.edu.iq/staff/alikassaim/lectures/CH-4.pdf](http://www.eng.uokufa.edu.iq/staff/alikassaim/lectures/CH-4.pdf)
2. [www.electronics-tutorials.ws/amplkifier/amp\_1.html](http://www.electronics-tutorials.ws/amplkifier/amp_1.html)
3. [www.colorado.edu/physics/phys3330/PDF/Experiment7.pdf](http://www.colorado.edu/physics/phys3330/PDF/Experiment7.pdf) [d.www.a](http://www.alldatasheet.com/view.jsp?searchword=Bc147)ll[datasheet.com/view.jsp?searchword=Bc147](http://www.alldatasheet.com/view.jsp?searchword=Bc147)

e. [www.williamson-labs.com](http://www.williamson-labs.com/)

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### Prof.S.K. Khaire Prof. S.K. Khaire

**(Name & signature of staff) (Name & signature of HOD)**