A N N A M A L A I U N I V E R S I T Y

(Accredited with 'A⁺' Grade by NAAC)

CENTRE FOR DISTANCE AND ONLINE EDUCATION

Annamalainagar – 608 002

<u>Semester Pattern: 2025-26</u>   - JANUARY SESSION

<u>Instructions to submit First Semester Assignments</u>

1. Following the introduction of semester pattern, it becomes **mandatory for candidates to submit assignment for each course.**

2. Assignment topics for each course will be displayed in the A.U, CDOE website (**www.audde.in**).

3. Each assignment contains 5 questions and the candidate should answer all the 5 questions. Candidates should submit assignments for each course separately. (5 Questions x 5 Marks =25 marks).

4. Answer for each assignment question should not exceed 4 pages. Use only A4 sheets and write on one side only. **Write your Enrollment number on the top right corner** of all the pages.

5. Add a template / content page and provide details regarding your Name, Enrollment number, Programme name, Code and Assignment topic. Assignments without template / content page will not be accepted.

6. Assignments should be handwritten only. Typed or printed or photocopied assignments will not be accepted.

7. **Send all First semester assignments in one envelope**. Send your assignments by Registered Post to The Director, Centre for Distance and Online Education, Annamalai University, Annamalai Nagar – 608002.

8. Write in bold letters, "ASSIGNMENTS – FIRST SEMESTER" along with PROGRAMME NAME on the top of the envelope.

9. Assignments received after the **last date with late fee** will not be evaluated.

   Date to Remember

   Last date to submit First semester assignments   : 15.04.2026
   Last date with late fee of Rs.300 (three hundred only)   : 30.04.2026

   Dr. S.ARULSELVI
   Director

019E1110: CLASSICAL AND STATISTICAL MECHANICS

1. A. State and explain principle of least action.

   b. Write Hamilton's variation statement and obtain the Lagrangian equation motion.

2. What is the concept of a canonical transformation? Derive equation describing a canonical transformation.

3. Derive Maxwell – Boltzmann law of distribution of velocities under kinetic theory of gases.

4. State and discuss Liouville's theorem by elaborating the principle of conservation of density in phase space.

5. Write short notes on

   a. Gibb's paradox
   b. Postulate of kinetic theory of gases
   c. Ensemble and its type
   d. D'Alembert's principle

019E1120: ELECTRONICS

1. a. Describe the construction and working of a p-channel depletion type MOSFET.

   b. Write short notes on

   i. Class-B amplifier,   ii. Class - C amplifier, iii. Push-pull amplifier.

2. Discuss Monostable and Bistable multivibrator.

3. a. Describe weighted resister DAC

   b. Draw the schematic circuit diagram and waveform of the A/D converter using voltage to frequency converter.

4. List the ROM applications and differentiate between ROM and RAM.

5. a. Explain the basic monolithic integrated circuits.

   b. Explain in detail about Hartly oscillator.

019E1130: MATHEMATICAL PHYSICS

1. **a**. S.T. the matrix $A = \begin{bmatrix} o & c & -b \\ -c & o & c \\ b & -a & a \end{bmatrix}$ satisfy Cayley Hamilton theorem

   b. Find the rank the following matrix

   $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 7 \\ 3 & 6 & 10 \end{bmatrix}$

2. a. Obtain any two recurrence relations for Legendre polynomials

   b. Evaluate the Gamma function $\Gamma\left(\frac{3}{2}\right)$

3. a. State and prove quotient law of tensors.

   b. Obtain power series solution for the Bessel's equation.

4. Solve the following differential equation using laplace transform

   $$y'' + 9y = 0, y(0) = 0, \qquad y'(0) = 1.$$

5. Find the residue of $\frac{z}{\cos z}$. At its poles