Assignment Booklet

BSCAEY Programme

B.Sc (Applied Sciences - Energy)

Second Semester	
BEY-002	Energy Resources
BEY-003	Fluid Mechanics
BEY-005	Energy Efficiency and Management
BEY-018	Linear Algebra and Calculus
BEY-020	Computer Basics and PC Software (4)

SCHOOL OF ENGINEERING & TECHNOLOGY
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
Maidan Garhi, New Delhi – 110 068

JANUARY 2026

Dear Student,

Please read the information on assignments in the Programme Guide that we have sent you after your enrolment. A weightage of 30%, as you are aware, has been earmarked for continuous evaluation, **which wouldconsist of one tutor-marked assignment** for this Programme. The assignment for BSCAEY (first semester) has been given in this booklet.

Instructions for Formatting Your Assignments

Before attempting the assignment, please read the following instructions carefully:

1) On top of the first page of your answer sheet, please write the details exactly in the following format:

ENROLLMENT NO :……

NAME :……

ADDRESS :……

……

……

PROGRAMME CODE: ……..

COURSE CODE: ……

COURSE TITLE: ……

STUDY CENTRE: ……..…… DATE: …….……...

PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE EVALUATION ANDTO AVOID DELAY.

2) Use only foolscap size writing paper (but not of very thin variety) for writing your answers.

3) Leave 4 cm margin on the left, top and bottom of your answer sheet.

4) Your answers should be precise.

5) These assignments submitted should be hand written in your own hand writing.

We strongly suggest that you should retain a copy of your answer sheets.

6) You cannot fill the Exam Form without submission of the assignments. So solve it and **submit it at the earliest.** If you wish to appear in the **TEE, June 2026,** you should submit your TMAs by **April 30, 2026.** Similarly, if you wish to appear in the **TEE, December 2026,** you should submit your TMAs by **September 30, 2026.**

7) Assignments will be submitted at **your respective regional centre.**

We wish you good luck!

Assignment -2

(To be done **after** studying the course material)

Course Code: BEY-003
Course Title: Fluids Mechanics
Assignment Code: BEY-003/TMA/2026
Maximum Marks: 100

Last Date of Submission: May 31, 2026 (For June TEE), September 30, 2026 (For December TEE)

Note:

1. All questions are compulsory.

Q.1	a)	Explain the concept of a fluid continuum. Why is this assumption necessary in fluid mechanics?	05
	b)	Distinguish between the following with suitable examples (any three): (5) • Ideal fluid and real fluid • Steady and unsteady flow • Uniform and non-uniform flow • Compressible and incompressible flow	05
Q.2	a)	Define viscosity. Explain Newton's law of viscosity and discuss the physical significance of viscosity in engineering applications.	05
	b)	Explain the effect of temperature and pressure on viscosity of liquids and gases with practical examples.	05
Q.3	a)	State and explain Pascal's law. Describe two engineering devices based on Pascal's law.	05
	b)	Explain pressure measurement in fluids. Compare piezometer, U-tube manometer, and differential manometer.	05
Q.4	a)	State Archimedes' principle and explain its importance in the design of ships and submarines.	05
	b)	Define metacentric height. Discuss its significance for stable, unstable, and neutral equilibrium of floating bodies.	05
Q.5	a)	Explain streamline, pathline, and streakline. Under what condition do they coincide?	05
	b)	Explain the equation of continuity. Discuss its physical meaning and engineering applications.	05
Q.6	a)	State Bernoulli's theorem. Clearly mention the assumptions involved in its derivation.	05
	b)	Discuss practical situations where Bernoulli's theorem fails. How are losses accounted for in real flows?	05
Q.7	a)	Explain laminar and turbulent flow. Discuss the role of Reynolds number in classifying fluid flow.	05
	b)	Explain different types of losses in pipe flow. Why are minor losses important in short pipelines?	05
Q.8	a)	Explain the concept of boundary layer development over a flat plate. What is boundary layer separation?	10
	b)	Differentiate between drag and lift forces. Discuss their significance in aerodynamic and hydraulic structures.	
Q.9	a)	Explain the principle of dimensional homogeneity. State the Buckingham π-theorem.	05
	b)	What is model analysis? Explain the importance of similarity (geometric, kinematic, and dynamic) in hydraulic models.	05

Q.10 Write short explanatory notes on any five of the following: (2 × 5 = 10) 10

a. Role of fluid mechanics in renewable energy systems
b. Fluid mechanics in biomedical engineering
c. Flow measurement techniques in industries
d. Importance of CFD in modern engineering design
e. Fluid flow considerations in water supply systems
f. Environmental applications of fluid mechanics