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Mechatronics — Complete Syllabus (Open Elective-2, Option 2)

BTEUP Diploma in Electrical Engineering • 4th Semester • Session 2026-27
Subject 4.7 (Open Elective-2, Theory) (Q) • 50 Marks internal • 2 Credits • L 2 – P 0 •
Choose this OR Economic Policies in India • Qualifying only

Please note — cover year vs approval: BTEUP's own file for this curriculum prints “YEAR 2025-2026” on its cover, while carrying the approval line “UPDATED AND APPROVED BY BOARD OF TECHNICAL EDUCATION U.P. LUCKNOW IN C.D.C MEETING HELD ON 16.07.2026” on every page. It is filed in BTEUP's 2026-27 folder (folder2627), so it is treated here as the 2026-27 syllabus on the strength of that approval. The scheme it carries is identical, subject for subject and mark for mark, to the 2025-26 scheme.

About this document: Open Elective-2 (4.7) is a (Q) qualifying subject — compulsory to appear and pass, but marks are not included for percentage and division. **Note:** the PDF's printed course objective for Mechatronics is about developing a project plan; the learning outcomes (understanding mechatronics, drivers, hydraulic & pneumatic systems) are what the aim below is drawn from.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
4.7	Mechatronics (Open Elective-2)	Theory (Q)	2 - 0	2	50	—	NA
Open Elective-2 Total				2	50	—	NA

What This Subject Aims To Do

To build an understanding of mechatronics — its systems and elements, drives, and hydraulic and pneumatic systems — and to identify problems and decide applications for future development.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
I	Introduction to Mechatronics	05	20%
II	Elements in Mechatronics	08	23%
III	Drives	05	20%
IV	Hydraulic Systems	05	20%
V	Pneumatic System	05	17%

Unit - I: Introduction to Mechatronics (05 Periods, 20%)

Topics: Introduction to System Concepts, Analysis and Design, Mechatronics basic definitions; systems and components; Systems with mixed disciplines, Electronics Fundamentals Review.

Unit - II: Elements in Mechatronics (08 Periods, 23%)

Topics: Data conversion devices, sensors, micro-sensors, transducers, signal processing devices, timers; Microprocessors, Microcontrollers, PID Controllers and PLCs.

Unit - III: Drives (05 Periods, 20%)

Topics: Stepper Motors, Servo Drives, Linear Motion bearings, cams; Systems controlled by camshafts, electronic cams, Tool magazines and indexing mechanisms.

Unit - IV: Hydraulic Systems (05 Periods, 20%)

Topics: Flow, Pressure and Direction Control Valves, Actuators, Supporting Elements, Hydraulic Power Packs, Pumps; Design of Hydraulic circuits.

Unit - V: Pneumatic System (05 Periods, 17%)

Topics: Production, Distribution and conditioning of compressed air; System Components and Graphic representations; Design of Systems.

Reference Books (as listed in the syllabus)

- Analysis and design of Dynamic Systems Cochin, Era and Cadwallender, Addison Wesley, 1997
- Mechatronics Engineering Tomkinson, D. And Horne, J. Longman McGraw Hill, 1996
- Mechatronics Bolton, W, Pearson Prentice Hall edition, 2008
- Fundamental of mechatronic M. Jouaneh Cengage Learning ISBN - 978-1111569020
- Mechatronics – An Integrated Approach Clarence W. de Silva CRC Press ISBN - 978-0849312748

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Source: BTEUP 2nd Year curriculum (folder2627) — cover prints YEAR 2025-2026, but the approval line 'UPDATED AND APPROVED BY BOARD OF TECHNICAL EDUCATION U.P. LUCKNOW IN C.D.C MEETING HELD ON 16.07.2026' appears on every page (95 times); treated as the 2026-27 curriculum. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text. Please confirm with your own polytechnic for any local changes.

