MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WB
Syllabus of B. Sc. In Automobile Technology
(Effective for 2023-2024 Admission Session)
Choice Based Credit System
140 Credit (3-Year UG)

OBJECTIVE

Any professional degree with experience matters a lot in this cut- throat competitive world. But in the world of science with a bit of twist in the domain can really make a difference! The present course on a graduation degree in ″ Automobile Technology″ under the CBCS format is designed in such a manner so as to offer with the golden chance to acquire a comprehensive knowledge not only on the basics of automobile and technical drawing but on the sci-tech involved in the rare areas of exploration viz. petrol engine, diesel engine, vehicle testing, auto electric systems, automotive safety and many more. Moreover, the specialization in their subsequent transmission, conditioning, electric vehicle technology etc. makes the matter more competent in the desired domain. In addition to the above, courses on Technical English, Entrepreneurship, Environmental Science, Computer Applications and Industrial training will surely assist to hone the skills for a better professional approach!

OUTCOMES

There is no tinge of doubt that there is always a quest of a lucrative job in the job jungle. Having armed with this prestigious degree will help to land up with jobs pertaining to the right profile. Be it an automobile technologist or a petrol diesel specialist or a vehicle performance tester or an air conditioner specialist in the relevant field, the sense of retaining ‘uniqueness’ persists all through. The specialization on E- Vehicles and many more appoints in reputed organizations with handsome packages. A complete knowledge of the course can truly aid in acquiring proficiency in Entrepreneurship, the Linguistic skills and Computer Applications. Money will never be a constraint for the appropriate candidate in an organization. More vistas will be observed to be opening up with the crossing of each milestone.

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CURRICULUM STRUCTURE

Semester-I							
Sl. No.	**Category**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
Theory + Practical							
1	**CC-1**	**BATC101** **BATC191**	Technical Drawing Technical Drawing Lab	**4**	**0**	**2**	**6**
2	**CC-2**	**BATC102** **BATC192**	Workshop Science &Calculation Workshop Science & Calculation Lab	**4**	**0**	**2**	**6**
3	**AECC-1**	**BATA101**	Technical English	**2**	**0**	**0**	**2**
4	**GE-1**		Anyone from GE Basket	**4 / 5**	**0 / 1**	**2 / 0**	**6**
						Total Credits	**20**

Semester-II							
Sl. No.	**Category**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
Theory + Practical							
1	**CC-3**	**BATC201** **BATC291**	Fundamentals of Automobile Technology Fundamentals of Automobile Technology Lab.	**4**	**0**	**2**	**6**
2	**CC-4**	**BATC202** **BATC292**	Basic Electrical & Electronics Basic Electrical & Electronics Lab.	**4**	**0**	**2**	**6**
3	**AECC-2**	**BATA201**	Environmental Science	**2**	**0**	**0**	**2**
4	**GE-2**		Anyone from GE Basket	**4 / 5**	**0 / 1**	**2 / 0**	**6**
						Total Credits	**20**

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Semester-III							
Sl. No.	**Category**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
Theory + Practical							
1	**CC-5**	**BATC301** **BATC391**	Petrol Engine Petrol Engine Lab.	**4**	**0**	**2**	**6**
2	**CC-6**	**BATC302** **BATC392**	Diesel Engine Diesel Engine Lab.	**4**	**0**	**2**	**6**
3	**CC-7**	**BATC303** **BATC393**	Automobile Body & Chassis Engineering Automobile Body & Chassis Engineering Lab.	**4**	**0**	**2**	**6**
4	**SEC-1**	**BATS301**	Computer Applications	**2**	**0**	**0**	**2**
5	**GE-3**		Anyone from GE Basket	**4 / 5**	**0 / 1**	**2 / 0**	**6**
						Total Credits	**26**

Semester-IV							
Sl. No.	**Category**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
Theory + Practical							
1	**CC-8**	**BATC401** **BATC491**	Auto Electrical systems &Transmission Auto Electrical systems &Transmission Lab	**4**	**0**	**2**	**6**
2	**CC-9**	**BATC402** **BATC492**	Automotive Air conditioning Automotive Air conditioning Lab	**4**	**0**	**2**	**6**
3	**CC-10**	**BATC403** **BATC493**	Vehicle performance and Testing Vehicle performance and Testing Lab	**4**	**0**	**2**	**6**
4	**SEC-2**	**BATS401**	Entrepreneurship	**2**	**0**	**0**	**2**
5	**GE-4**		Anyone from GE Basket	**4 / 5**	**0 / 1**	**2 / 0**	**6**
						Total Credits	**26**

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Semester-V							
Sl. No.	**Category**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
Theory + Practical							
1	**CC-11**	**BATC501**	Automotive safety	**5**	**1**	**0**	**6**
2	**CC-12**	**BATC502** **BATC591**	Two and three wheeler technology Two and three wheeler technology Lab.	**4**	**0**	**2**	**6**
3	**DSE-1** **Any one**	**BATD501**	Urban Transport Planning	**5**	**1**	**0**	**6**
		BATD502	Fundamentals of Electric Vehicle				
4	**DSE-2** **Any one**	**BATD503** **BATD591**	CAD/CAM technology in Automobile CAD LAB	**4**	**0**	**2**	**6**
		BATD504 **BATD592**	Electric Drives and Controller for Electric Vehicles Electric Drives and Controller for Electric vehicles LAB				
						Total Credits	**24**

Semester-VI							
Sl. No.	**Category**	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
Theory + Practical							
1	**CC-13**	**BATC601**	Automotive Pollution Control	**5**	**1**	**0**	**6**
2	**CC-14**	**BATC602**	Transport Management and Motor Vehicle Act	**5**	**1**	**0**	**6**
3	**DSE-3**	**BATD691**	Project	**0**	**1**	**5**	**6**
4	**DSE-4**	**BATD692**	Industrial Training	**0**	**1**	**5**	**6**
						Total Credits	**24**

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Semester I

Detailed Syllabus

B.Sc. in Automobile Technology **Course: Technical Drawing** **Technical Drawing Lab**	
Course Code: BATC101+BATC191	**Semester: I**
	Maximum Marks: 100+100
Teaching Scheme	**Examination Scheme**
Theory: 4	End semester Exam: 70
Tutorial: 0	Attendance: 5
Practical: 2	Continuous Assessment: 25
Credit: 6	Practical Seasonal internal continuous evaluation: 40
	Practical Seasonal external examination: 60

Sl. No.	Course Outcomes	Mapped module/Unit	Bloom's Level
1	The candidates will be able to develop a unique interest in the scope and projections , importance of engineering drawing as a communication medium, drawing instrumentation, lettering and dimensioning	U1	1,2
2	The students will be able to understand the geometrical aspects such as perpendiculars, polygon, definition of focus, hyperbola construction, circle and eccentricity	U1,U2	1,2,3
3	The students will be helped to acquire an in depth knowledge on the planes of projection, angles, projections, straight lines, solids and conversion	U1,U3	1,2.,3
4	The candidates will be able to understand the concepts of isometric scale, drawing of plane figures, prisms and pyramids and the sectional views of section planes, cones and cylinders.	U1, U4	1,2,3

Sl. No.	Course Objective
1	The students will be able to acquire a deemed knowledge on the projections and the variety of technical drawing
2	To equip them with the technical and aesthetic values embedded
3	Prepare them to display their efficiency both in an organization and at personal front
4	Prepare them with enough adequacy to face the market syntax confidently

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Detailed Syllabus

Course Code:	**BATC101**	
Course:	**Technical Drawing**	Credits: 4.0
Contents		
Chapter	**Name of the Topic**	**Hours**
Unit-I	**Introduction:** Introduction: Scope and objective of the subject, Importance of engineering drawing as a communication medium, Drawing instruments and their uses, Scales: Recommended scales, reduced & enlarged, Sheet sizes: A0, A1, A2, A3, A4, A5. Layout of drawing sheet, sizes of title block and its contents, Simple exercises on the use of drawing instruments. Lettering and Dimensioning: Types of Lettering, Guide Lines for lettering, Recommended sizes of letters and numbers, Single stroke letters, Dimensioning - rules and systems of dimensioning - dimensioning, a given drawing.	14
Unit-II	**Geometric Construction:** Bisecting a line - perpendiculars - parallel lines - division of a line, Angles - bisection, trisection, Tangent lines touching circles internally and externally, Polygons - Regular polygons - circumscribed and inscribed in, circles. , Conic sections - Definitions of focus, directrix, eccentricity, (i) Construction of Ellipse by Concentric circles method, (ii) Construction of parabola by rectangular method, (iii) Construction of Hyperbola when given the position of point, from X - axis and Y - axis.	12
Unit-III	**Orthographic Projection:** Definition - Planes of Projection - Four quadrants - Reference line., First angle projection - Third angle projection, Projections of points, Projections of straight lines, Projections of planes, Projections of solids, Conversion of pictorial views into orthographic views,	10
Unit-IV	**Isometric Projection:** Definition - Isometric axes, lines and planes, Isometric Scale - Isometric view, drawing of isometric views of plane figures, drawing of isometric views of prisms and pyramids, Drawing of isometric view of cylinders and cones. Sections of Solids: Need for drawing sectional views - section planes - true shape of a section, Sections of prisms and pyramids, Sections of cones and cylinders.	12
	Total:	48

Course Code: **BATC191**	**Course: Technical Drawing Lab**
Credit: 2	**practical**
Practice session as per the syllabus of Technical Drawing (BATC101)	

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List of Books

Sr. No.	Name of Author	Title of the BOOK	Edition/ISSN/ISBN	Publication
1	Pradeep Jain & A.P. Gautam	Engineering Graphics & Design		Khanna Publishing House
2	MB Shah and BC Rana	Engineering Drawing	Second Edition	Pearsons
3	P. S. Gill, S. K. Kataria and Sons	Engineering Graphics and Drafting	Indian Ed	Routledge(T&F Group)Pub
4	RK Dhawan, S Chand & Company	A Text Book of Engineering Drawing.		Tata McGraw Hill
5	N. D. Bhatt	Engineering Drawing Plane and Solid Geometry	New Delhi	Charotar Publishing House.

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B.Sc. in Automobile Technology **Course: Workshop Science & Calculation** **Workshop Science & Calculation Lab**	
Course Code: BATC102+BATC192	**Semester: I**
	Maximum Marks: 100+100
Teaching Scheme	**Examination Scheme**
Theory: 4	End semester Exam: 70
Tutorial: 0	Attendance: 5
Practical: 2	Continuous Assessment: 25
Credit: 6	Practical Seasonal internal continuous evaluation: 40
	Practical Seasonal external examination: 60

Sl. No.	Course Outcomes	Mapped module/Unit	Bloom's Level
1	The students will be able to understand the use of engineering materials, properties, casting, non metals and safety precautions	U1	1,2
2	The candidates will develop a clear cut concept in the fields of fitting and drilling , cutting tools, striking tools, fitting operations, sheet metal work, use of metal sheet work, sheet metal operations	U1,U2	1,2,3
3	The students will be able to focus on the concepts of forging and welding, hand tools, hot working process, cold working process and limitations.	U1,U3	1,2, 3
4	The students will be able to understand on lathe and grinding principles, applications and operations.	U4	1,2,3

Sl. No.	Course Objective
1	To make them prepare the conventional aspects of the subject
2	To equip them both at the professional and personal fronts
3	To emphasize on the practical domain of the whole matter
4	To understand the ingrained scientific and aesthetic values

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Course Code:	**BATC102**	
Course:	**Workshop Science & Calculation** Credits: 4.0	
Contents		
Chapter	**Name of the Topic**	**Hours**
Unit-I	**Engineering materials:** Contents: Properties and uses of common Engineering Materials such as Cast Iron, Mild Steel, High Carbon Steel, Alloy Steel, Stainless Steel, Copper, Brass, Tin, Zinc, Gunmetal, Bronze, White metal, Aluminium. Non Metals: Wood, Plastic, Rubber. Importance of safety Precautions in Workshop	10
Unit-II	**Fitting and Drilling:** Contents: Cutting Tools - Chisels, Hacksaws, files, scrapers, Drill Bits, reamers Taps, Dies and Sockets. Striking tools : Hammers, Holding Devices : Vices, Marking Tools & Miscellaneous tools Checking & Measuring Instruments Calipers & Dividers Drilling Machines - Sensitive and Radial Drilling Machines Various Fitting and Drilling operations Sheet Metal Work Contents : Metals used for sheet metal work, sheet metal hand tools - measuring and cutting tools, stakes, Sheet metal operations - Shearing, bending, Drawing, Squeezing Sheet metal joints - Hem & Seam Joints, Fastening Methods - Riveting, soldering, Brazing and spot welding.	14
Unit-III	**Forging & Welding:** Contents: Hand Tools, Heating Devices, Smith Operations, Machine Forging, forging hammers, forging press, Welding: Arc welding & Gas Welding Mechanical Working of Metals Contents: Hot working process - Rolling, Piercing, Drawing, Spinning, Extrusion. Cold Working Process: Rolling, Bending, drawing, spinning Extrusion, squeezing, peening, Advantages and limitations of cold working & hot working	14
Unit-IV	**Lathe & Grinding:** Contents: Lathe main parts, simple operations, Grinding - working principle; Grinding wheel materials, Applications of Grinding.	10
	Total:	48

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Course Code: BATC192	**Course: Workshop Science & Calculation Lab**
Credit: 2	**List of practical**

1	Identification of metals and non-metals
2	Uses of different types of marking and measuring tools.
3	Uses of different types of cutting tools.
4	Different types of fitting jobs
5	Methods of making permanent and semi permanent joints
6	Hot working process
7	Cold working process
8	Different types welding and its application
9	Different operation in lathe machine
10	Different types of grinding machine and its application
11	Different types of drill machine and its application

List of Books

Sr. No.	**Name of Author**	**Title of the BOOK**
1	Hazra& Chaudhary, Asian Book Comp. , New Delhi	Workshop Technology Vol. I & II
2	Chapman, WAJ, Edward Arnold.	Workshop Technology, Vol. 1, 2 & 3 -
3	J. K. Gupta	A Textbook of Workshop Technology,

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B.Sc. in Automobile Technology **Course: Technical English**	
Course Code: BATA101	**Semester: I**
	Maximum Marks: 100
Teaching Scheme	**Examination Scheme**
Theory: 2	End semester Exam: 70
Tutorial: 0	Attendance: 5
Practical: 0	Continuous Assessment: 25
Credit: 2	Practical Seasonal internal continuous evaluation: 0
	Practical Seasonal external examination: 0

Sl. No.	Course Outcomes	Mapped module/Unit	Bloom's Level
1	The students will be able to develop the capacity of understanding short textual passages effectively, basic grammar and writing skills	U1	1,2
2	The students will be able to understand the basic topics of Grammar their relevant application and develop the writing skills of letter and short book reviews	U1,U2	1,2,3
3	The students will be able to comprehend the techniques of Writing and importance of interviews and soft skills	U1,U2,U3	1,2,3
4	The students will show interest in developing the Reading, Speaking and Analytical skills. Writing CV and Resume. Interview sessions.	U1,U3,U4	1,3,4

Sl. No.	Course Objective
1	Learn and understand the application of Grammar for flawless public speaking
2	Learn and Develop the art of writing to express effectively.
3	Develop the tactics of showing confidence in tackling critical situations.
4	Widen the mental horizon in the field of Science and Technology.

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Semester I

Detailed Syllabus

Course Code:	**BATA101**	
Course:	**Technical English** Credits:2.0	
Contents		
Chapter	**Name of the topic**	**Hours**
Unit-I	Short Comprehension passages to test the level understanding for answering questions. Parts of Speech. Tenses. Formation of WH Questions. Word Formation. Use of Prefix and Suffix. Subject - Verb agreement. Degrees of Comparison. Paragraph Writing (descriptive, scientific, technical argumentativetypes).	**7**
Unit-II	Jumbled sentences, Process Writing, Preposition, Narration, one-word Substitution and use of selected idiomatic expression sin sentences. Letter Writing (Formal and Informal types). Short book reviews. Use of Countable and Uncountable nouns. Articles. Synonyms and Antonyms (Selected ones). Phrasal Verbs (Selected ones).	**7**
Unit-III	Use of Modal Verbs. Interview Writing. Group Discussion. (Selected Contemporary issues).	**4**
Unit-IV	CV and Job Application Writing. Differences between CV and Resume. Mock interview Sessions Side Door Intrusion, Crash test with dummies, Demist test, Defrost Test, Interior Fittings, Steering Impact test (GVW)	**6**
	Total	**24**

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Name of Author	Title of the Book	Name of the Publisher
R.C. Sharma and K. Mohan	Business Correspondence and Report Writing	Tata McGraw Hill
L. Gartside	Model Business Letters	Pitman
R.K.Madhukar	Business Communication	Vikas Publishing House
Wren & Martin	High School English Grammar and Composition	S.Chand
M.Raman & S.Sharma	Technical Communication	Oxford Pub. House
Urmila Rai & S.M.Rai	Business Communication	Himalaya Pub. House

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Semester II

Detailed Syllabus

B.Sc. in Automobile Technology **Course: Fundamentals of Automobile Technology** **Fundamentals of Automobile Technology Lab**	
Course Code: BATC201 + BATC291	**Semester: II**
	Maximum Marks: 100+100
Teaching Scheme	**Examination Scheme**
Theory: 4	End semester Exam: 70
Tutorial: 0	Attendance: 5
Practical: 2	Continuous Assessment: 25
Credit: 6	Practical Seasonal internal continuous evaluation: 40
	Practical Seasonal external examination: 60

Sl. No.	Course Outcomes	Mapped module/Unit	Bloom's Level
1	The students will be able to understand the basic classification of automobiles, components of an automobile function, lay out of frame, frameless constructions, gear box, final drive, vehicle body, wheels and tyres.	U1	1,2
2	The students will understand the importance of selection of engine for two, three and four wheelers, working construction, lubrication, cooling system, combustion and chambers.	U2	1,2,3
3	The students will be able to understand the basic terms and the associated skills with steering system, requirement details, gear boxes, concept and working of power steering, types of suspension systems, details, coil springs.	U3	1,2,3
4	The students will be able to understand the importance and concepts of wheel requirements, types, working details, comparison, application, wheel balancing, brakes and working of master cylinder, wheel cylinder, brake fluid	U4	1,2,3

Sl. No.	Course Objective
1	To introduce students to basics of automobile technology
2	To understand the various components
3	To gain knowledge of various terms associated with automobile technology
4	To enable the students to identify and differentiate the different components
5	To enable the students to remember different sub-systems and its components

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Course Code:	**BATC201**	
Course:	**Fundamentals of Automobile Technology** Credits:4.0	
Chapter	**Name of the Topic**	**Hours**
Unit-I	**Introduction:** Classification of automobiles - according to number of wheels, propulsion systems, transmission drives, type of fuels, application & capacity, study of main specifications. Components of an automobile functions & layout of frame, frameless construction, axles, steering system, suspension system, braking system, power train & drives, clutch, gear box, final drive, propeller shaft, u - joints, vehicle body, wheels, tyres & tubes.	**12**
Unit-II	**Power Unit:** Selection of engine for two wheelers, three wheeler & four wheeler vehicles; constructional & working details of two strokes & four stoke petrol & diesel engines, fuel system, ignition system, starting system, charging system, lighting system, cooling system, lubrication system, combustion & combustion chambers.	**11**
Unit-III	**Steering System and Suspension System:** Steering system - requirements, front axle details & steering geometry, castor, camber, toe in, toe out steering axis inclination, steering linkages, and different types of steering gear boxes, their constructional & working details. Concept and working of power steering. Need, types of suspension systems, constructional details, characteristics of laminated, coil springs. Introduction to independent suspension, front & rear suspension systems of the vehicle, shock absorbers.	**13**
Unit-IV	**Wheels, Tyres & Braking System:** Wheel requirements, types of wheels, their constructional & working details, rims & tyres, types of tyres, tyre selection, ordinary, radial tyres tubeless tyres, their constructional details, comparison & application, wheel balancing. Need and classification of brakes, drum brakes and disc brakes, constructional & working details, introduction to hydraulic brake, parking brake, vacuum assisted hydraulic brakes, air assisted hydraulic brakes, air brakes, leading & trailing brake shoes, self-energizing brakes & ABS, working of master cylinder, wheel cylinders, tandem master cylinder, characteristics of brake fluid.	**12**
	Total:	**48**

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Course Code: BATC291	**Course: Fundamentals of Automobile Technology Lab**
Credit: 2	**List of practical**
1	Identification of different chassis components of a vehicle
2	Identification of different components of S.I. engine.
3	Identification of different components of C.I. engine.
4	Identification of different components of lubrication system of an engine.
5	Identification of different components of cooling system of an engine.
6	Identification of different components of fuel supply system of S.I. engine.
7	Identification of different components of fuel supply system of C.I. engine.
8	Identification of different components of ignition system of S.I. engine.
9	Identification of different components of starting system of an engine..
10	Identification of different components of transmission system of a car.
11	Identification of different components of steering system of a car.
12	Identification of different components of suspension system of a car.
13	Identification of different components of braking system of a car.

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Sr. No.	Name of Author	Title of the BOOK	Publication
1	A.K. Babu	Automobile Mechanics	
2	Mehrdad Ehsani and Yimin Gao	Modern Electric, Hybrid Electric, and Fuel Cell Vehicles: Fundamentals, Theory, and Design	Khanna Publishing House
3	Tom Denton	"Automobile Engineering"	Routledge(T&F Group) Pub
4	P. L. Kohli	"Automotive Chassis & Body"	Tata McGraw Hill
5	Wei Liu	Introduction to Hybrid Vehicle System Modeling and Control	Tata McGraw Hill,
6	Newton Steeds and Garrot	"Motor Vehicles"	Butterworths
7	Judge A. W	"Mechanism of the Car"	Chapman and Halls Ltd.
8	Crouse W. H	"Automotive Chassis and Body"	Mcgraw - Hill
9	K. K. Jain, R. B. Asthana	"Automobile Engineering"	Tata McGraw Hill
10	Dr. Kirpal Singh	"Automobile Engineering (Vol - 1)"	Standard Publisher Distributors

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Semester II

Detailed Syllabus

B.Sc. in Automobile Technology
Course: Basic Electrical & Electronics
Basic Electrical & Electronics Lab

Course Code: BATC202 + BATC292	**Semester: II**
	Maximum Marks: 100+100
Teaching Scheme	**Examination Scheme**
Theory: 4	End semester Exam: 70
Tutorial: 0	Attendance: 5
Practical: 2	Continuous Assessment: 25
Credit: 6	Practical Seasonal internal continuous evaluation: 40
	Practical Seasonal external examination: 60

Sl. No.	Course Outcomes	Mapped module/Unit	Bloom's Level
1	The students will be able to understand the basics of electricity and circuits, invention, quantities, elements, sources, laws and wiring.	U1	1,2
2	The students will be able to know the principle of operation, moving coil, resistance, capacitance, energy measurements , calculations.	U1, U2	1,2
3	The students will be able to know about electronic machine conduction, operation, application, features and the basic electronics and communication, diode, types, energy efficient equipments.	U1, U3,U4	1,2,3
4	The students will gain knowledge on the protection, safety and Indian electricity scenario, hazards of shock, burn, thermal radiation, electric powers.	U5	1,2,3

Sl. No.	Course Objective
1	To understand the Basic Fundamentals in Electrical Circuits.
2	To study the construction, Principle of operation and performance of DC and AC Machines
3	To understand the principles of PN Junction diode and BJT.
4	To Study the protection and safety measures in Electricity

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Course Code:	**BATC202**	
Course:	**Basic Electrical & Electronics** Credits:4.0	
Chapter	**Name of the Topic**	**Hours**
Unit-I	**FUNDAMENTALS OF ELECTRICITY AND CIRCUITS:** Evolution of Electricity and Inventions- Electrical Quantities—Charge- Electric Potential, Voltage, Current, Power Energy, DC, AC, time period, Frequency, Phase, Flux density, RMS, Average, Peak, Phasor and Vector diagram. Electric circuit elements – Sources - Ohm's Law - Kirchhoff's Laws, Faradays Law, Lenz's Law- Wiring- House wiring and Industrial Wiring systems.	**8**
Unit-II	**MEASURING INSTRUMENTS:** Principle of Operation Moving Coil and Moving Iron Types of Voltmeters and Ammeters Multi-meters Measurements of resistance, inductance & Capacitance- Power and Energy Measurements- Energy Efficient Equipment's and sample load (Domestic load) calculations.	**8**
Unit-III	**ELECTRICAL MACHINES:** Construction - Principle of Operation - EMF Equation –Application of DC Generator, DC Motor – types and Characteristics – Applications – Transformer-AC Machines – Construction, Operation and types of Single phase and three Phase Induction Motors.	**8**
Unit-IV	**BASIC ELECTRONICS AND COMMUNICATION:** PN Junction Diode, Zener Diode – V-I Characteristics – Applications – Rectifier – Half Wave – Full Wave and Rectifiers – Transistors types – Transistor as an Amplifier –– Junction Field Effect Transistor (JFET) operation and characteristics, SCR - characteristics and its applications- CRO-Principle of Cathode Ray Tube- regulated power Supply- Function Generators. Communication systems- types- Analog, Digital and Wireless.	**12**
Unit-V	**PROTECTION, SAFETY AND INDIAN ELECTRICITY SCENARIO:** Hazards of Electricity-Shock, Burns, arc- blast, Thermal Radiation, Explosives, fires, effect of electricity on the human Body. Electrical safety practices, Protection devices. Electrical power- Generation resources- transmission and Distribution. Regulatory authorities- role of MNRE, MNRE, NTPC, TEDA, TANGEDCO.	**12**
	Total:	**48**

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Course Code: BATC292	**Course: Basic Electrical & Electronics Lab**
Credit: 2	**List of practical**

1	Measurement of electrical quantities (like voltage, current, power, power factor in RLC circuits)
2	Testing of the following popular components: Resistor, Potential meter, Inductor (Only continents), Capacitor, Diode, BJT, LED, SCR, Few digital ICs and analog ICS.
3	Techniques of Soldering.
4	Familiarization of the following equipment Multi meter, Signal Generator, CRO etc.
5	Multi-meter:- voltage, current, resistance measurement.
6	Regulated Power Supply: - Set up for certain output voltage and measure it with multi-meter.
7	Signal generator and CRO: - check the signal generator frequencies and amplifier with CRO.
8	555 applications.

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List of Books

Sr. No.	Name of Author	Title of the BOOK	Publication
1	S.Hasan Saeed, D.K.Sharma	Non-Conventional Energy Resources, Katson Books	
2	John Cadick, Mary Capelli-Schellpfeffer, Dennis Neitzel, Al Winfield	'Electrical Safety Handbook'	McGraw-Hill Education,
3	D.P.Kothari and I.J. Nagarath	"Basic Electrical & Electronics Engineering."	Mc.Grawhill publications
4	Leonard S Bobrow	"Foundations of Electrical Engineering".	Oxford University Press, 2013
5	Vincent Del Toro	Electrical Engineering Fundamentals,	Prentice Hall, 2006.
6	V.K. Mehta & Rohit Mehta,	Principles of Electrical Engineering,	S.Chand Publications,
7	John Bird	"Electrical Circuit Theory and Technology"	Elsevier
8	Maxwell Adams.J	Electrical Safety- a guide to the causes and prevention of electric hazards'.	IET 1994.
9	Ray A. Jones, Jane G. Jones	'Electrical Safety in the Workplace	Jones & Bartlett Learning,2000.

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Semester II
Detailed Syllabus

B.Sc. in Automobile Technology **Course: ENVIRONMENTAL SCIENCE**	
Course Code: BATA201	**Semester: II**
	Maximum Marks: 100
Teaching Scheme	**Examination Scheme**
Theory: 2	End semester Exam: 70
Tutorial: 0	Attendance: 5
Practical: 0	Continuous Assessment:25
Credit: 2	Practical Seasonal internal continuous evaluation: 0
	Practical Seasonal external examination: 0

Sl. No.	Course Outcomes	Mapped module/Unit	Bloom's Level
1	The students will be able to critically think the importance of environmental affairs such as components, cycles and degradation.	U1	1,2
2	The students will be able to understanding about interdisciplinary nature of environmental issues, elements and ecological balance.	U2	1,2
3	The students will be able to conduct Independent research regarding environmental problems (different pollution, causes and remedies) in form of project report.	U3,U4, U5,U6	1,2, 3,4
4	The students will be able to understand social interactions by which humans behave and cultural values play.	U1,U2	1,2

Sl. No.	Course Objective
1	The students will be able to create an awareness of themselves about environmental issues, components, degradation and cycles.
2	The students will be able to nurture the curiosity of students pertaining to elements of ecology and ecological balance
3	The students will be able to acquire knowledge on different kinds of pollution, causes and remedies.
4	To develop the sense of understanding between the environment and socio – cultural principles and policies.

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Course Code:	**BATA201**	
Course:	**ENVIRONMENTAL SCIENCE** Credits:2.0	
Chapter	**Name of the Topic**	**Hours**
Unit-I	**Introduction** Introduction to environment and ecology Components of the environment, environmental degradation, natural cycles of environment.	**6**
Unit-II	**Ecology** Elements of Ecology, Ecological balance, Effects of Afforestation and deforestation	**3**
Unit-III	**Air Pollution and Control** Atmospheric composition, Segments of atmosphere climate, weather, Atmospheric Stability, dispersion of pollutants, Sources and effects of air pollutants, primary and secondary pollutants**,** Criteria Pollutants:PM10, Source, Effect, Control, CO, NOx, Source, Effect**,** Control, SOx, Source, Effect, Control, Lead, Ozone, Source, Effect, Control, Greenhouse effect, Control Measures ,Depletion of ozone layer, Effects of UV exposer, Control Measures.	**4**
Unit-IV	**Water Pollution and Control** Hydrosphere, natural water resources and reserves, Pollutants: their origin and effects, COD and BOD test, NBOD and CBOD, River / lake / ground water pollution, Control Measures of water pollution, Drinking water and waste water treatment.	**4**
Unit-V	**Land Pollution** Lithosphere, pollutants [municipal, industrial, commercial, agricultural, hazardous solid wastes] their origin and effects, Collection and disposal of solid waste, recycling and treatment methods.	**4**
Unit-VI	**Noise Pollution** Sources, effects, standards and control	**3**
	Total	**24**

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Sr. No.	Name of Author	Title of the BOOK	Publication
1	Basu, M. and Xavier, S.	Fundamentals of Environmental Studies	Cambridge University Press
2	Mitra, A. K and Chakraborty, R.	Introduction to Environmental Studies	Book Syndicate.
3	Enger, E. and Smith, B.	Environmental Science: A Study of Interrelationships	McGraw-Hill Higher Education
4	Basu, R.N	Environment	University of Calcutta