

Vision and Mission of the TVE Department

Vision Statement

To become a world class center of excellence for Technical and Vocational Education by virtue of offering quality teaching, achieving high standard research, and learning and ensuring continual professional development in line with the philosophy of education for work to realize the vision of OIC Member countries.

Mission Statement

To produce technical educationists, technical teachers trainers and researchers having strong theoretical and practical underpinning in the diverse areas within the technical and vocational education. The ultimate mission is to explore, expand and apply knowledge and skills to serve OIC member countries by educating and training Muslim Ummah in particular and the global as a whole with the necessary know-how and expertise to become competitive human resources.

Objectives

1. To develop market oriented academic programmes that fulfil TVET teachers' Standards and employment requirements of OIC Member countries.
2. To produce graduates with excellent academic achievement.
3. To ensure that all academic and non-academic staff accumulate at least 48 hours of professional training in a year.
4. To ensure maximum collaboration and cooperation with foreign universities, research institutions, local industries and developmental organizations in the area of teaching, research, consultancy, skills development and lifelong learning for sustainable development.

Course offered by TVE Department

- Diploma in Technical Education (DTE)
- Bachelor of Science in Technical Education (B.Sc.T.E)
- Post Graduate Diploma in Technical Education (PGDTE)
- Master of Science in Technical Education (M.Sc.T.E)

Diploma in Technical Education (DTE)

First Semester

L = Lecture P = Practical / Workshop

T= Tutorial

Course Number	Course Title	Contract Hours	Credit Hours
		L – T - P	
Hum 4132	Arabic I	0-0-2	1.00
or			
Hum 4134	English I		
Hum 4137	Islamiat	2-0-0	2.00
TVE 4103	Educational Psychology	3-0-0	3.00
TVE 4125	Methods and Techniques of Teaching	3-0-0	3.00
TVE 4126	Methods and Techniques of Teaching lab	0-0-2	1.00
TVE 4151	Technical & Vocational Education Ethics & Society	3-0-0	3.00
Technical Courses	Two Technical courses from The respective specialization	6-0-3*	7.50
	Total	17-0-7*	
	Total	24*	20.50*

*There may be slight deviation for different specialization.

Second Semester

L = Lecture P = Practical / Workshop

T= Tutorial

Course Number	Course Title	Contract Hours	Credit Hours
		L – T - P	
Hum 4232	Arabic II	0-0-2	1.00
or			
Hum 4234	English II		
Hum 4237	Islamic History Science & Culture	3-0-0	3.00
TVE 4239	Principles of Technical & Vocational Education	3-0-0	3.00
TVE 4258	Observation and Practice Teaching	0-1-4	2.50
TVE 4259	Educational Technology	2-0-0	2.00
TVE 4260	Educational Technology Lab	0-0-3	1.00
TVE 4235	Educational Measurement and Evaluation	3-0-0	3.00
Technical Courses	Two Technical courses from The respective specialization	6-0-3*	7.50
	Total	17-1-11*	23.00*
	Total	29*	

*There may be slight deviation for different specialization.

Diploma in Technical Education (DTE)

Specialization: Mechanical Engineering

First Semester

L = Lecture P = Practical / Workshop

T= Tutorial

Course Number	Course Title	Contract Hours	Credit Hours
		L - T - P	
MCE 4391	Refrigeration and Air-conditioning	3-0-0	3.00
MCE 4392	Refrigeration and Air-conditioning Lab	0-0-1.5	0.75
MCE 4393	Automotive Technology	3-0-0	3.00
MCE 4394	Automotive Technology Lab	0-0-1.5	0.75
		6-0-3	7.50

* Two technical courses from the respective specialization.

Second Semester

L = Lecture P = Practical / Workshop

T= Tutorial

Course Number	Course Title	Contract Hours	Credit Hours
		L - T - P	
MCE 4491	Advanced Manufacturing Process	3-0-0	3.00
MCE 4492	Advanced Manufacturing Process Lab	0-0-1.5	0.75
MCE 4493	Automotive Maintenance Engineering	3-0-0	3.00
MCE 4494	Automotive Maintenance Engineering Lab	0-0-1.5	0.75
		6-0-3	7.50

* Two technical courses from the respective specialization.

Diploma in Technical Education (DTE)

Specialization: Electrical and Electronic Engineering

First Semester

L = Lecture		P = Practical / Workshop		T= Tutorial	
Course Number	Course Title	Contract Hours	Credit Hours	Contract Hours	Credit Hours
EEE 4391	Electrical Machine I	3-0-0	3.00		
EEE 4392	Electrical Machine I Lab	0-0-1.5	0.75		
EEE 4393	Electrical Measurement & Instrumentation I	3-0-0	3.00		
EEE 4394	Electrical Machine I Lab	0-0-1.5	0.75		
EEE 4395	Electrical Power Transmission	3-0-0	3.00		
EEE 4396	Electrical Power Transmission Lab	0-0-1.5	0.75		
EEE 4397	Digital Techniques I	3-0-0	3.00		
EEE 4398	Digital Techniques I Lab	0-0-1.5	0.75		
EEE 4381	Basic Electronics	3-0-0	3.00		
EEE 4382	Basic Electronics Lab	0-0-1.5	0.75		
		6-0-3	7.50		

* Two technical courses from the respective specialization.

Second Semester

L = Lecture		P = Practical / Workshop		T= Tutorial	
Course Number	Course Title	Contract Hours	Credit Hours	Contract Hours	Credit Hours
EEE 4491	Electrical Machine II	3-0-0	3.00		
EEE 4492	Electrical Machine II Lab	0-0-1.5	0.75		
EEE 4493	Electrical Measurement & Instrumentation II	3-0-0	3.00		
EEE 4494	Electrical Measurement & Instrumentation II Lab	0-0-1.5	0.75		
EEE 4495	Power System Analysis	3-0-0	3.00		
EEE 4496	Power System Analysis Lab	0-0-1.5	0.75		
EEE 4497	Digital Techniques I	3-0-0	3.00		
EEE 4498	Digital Techniques I Lab	0-0-1.5	0.75		
		6-0-3	7.50		

* Two technical courses from the respective specialization.

Diploma in Technical Education (DTE)

Specialization: Computer Science and Engineering (CSE)

First Semester

L = Lecture P = Practical / Workshop

T= Tutorial

Course Number	Course Title	Contract Hours	Credit Hours
CSE 4173	Introduction to Database Management System	3-0-0	3.00
CSE 4174	Introduction to Database Management System Lab	0-0-1.5	0.75
CSE 4175	Computer Programming	3-0-0	3.00
CSE 4176	Computer Programming lab -I	0-0-1.5	0.75
CSE 4177	Computer Organization and Architecture	3-0-0	3.00
		6-0-3	7.50

* Two technical courses from the respective specialization.

Second Semester

Course Number	Course Title	Contract Hours	Credit Hours
CSE 4273	System Analysis and Design	3-0-0	3.00
CSE 4274	System Analysis and Design Lab	0-0-1.5	0.75
CSE 4276	Computer programming Lab - II	0-0-1.5	0.75
CSE 4277	Data Structures and Algorithms	3-0-0	3.00
CSE 4278	Data Structures and Algorithms Lab	0-0-1.5	0.75
CSE 4279	Data and Telecommunications	3-0-0	3.00
		6-0-3	7.50

* Two technical courses from the respective specialization.

First Semester

Hum 4132	Arabic-I	0-0-2	Credit 1.00
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Reading comprehension; Letters and pronunciation; Construction of words; Use of Letters (Shamsi & Kamari) in words; Use of Determiners and pronouns; Use of Interrogatives; Use of Nominal and verbal sentences, Use of adverbs; Use of tenses; Use of feminine and masculine genders; Use of numerals; Use of conjunctive adverbs; Use of every day's conversation and dialogues and practice.

Text Books:

1. Abdur Rahman, I. A. F. (2004). الطالب كتاب يدك بين العربية Al-Arabiah Baina Yadaik Kitabut Talib (1), Arabic for All, Kingdom of Saudi Arabia.
2. Abdur Rahim, V. (2004). Madina Arabic Reader, Goodword Books, India.
3. Abu Tahir Al-Misbah (2013). Al-Tariq Ila Al-Arabiah, Darul Kalam, Madrasatul Madina, Dhaka.

Hum 4134	English -1	0-0-2	Credit 1.00
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Listening & Speaking: Situational dialogues; Use of dialogues in conversations; Reading out, talks; Listening to prescribed cassettes; watching documentaries. Reading: Reading comprehension; Reading for pleasure; Reading for understanding; Reading with strategies. Writing & Grammar: Word classes, sentence types; Number, person, gender; Tenses and sequences of tenses; Nouns and determiners; Operators; If-clauses; Paragraphs & letters; Text analysis. Vocabulary: In lists; Contextualized; In talks; In exercises.

Text Books:

1. Liz and John Soars (2003). New Headway (Intermediate, 3rd edition, Oxford University Press.
2. John Eastwood (2002). Oxford Practice Grammar, 2nd edition, Oxford University Press.

Hum 4137	Islamiat	2-0-0	Credit 2.00
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Islam as Din; Sources of Islamic Code of Life; Social, Economic and Political system of Islam; Islamic; Ethics: Human values in Islam, Dignity of Man, Women & Islam Family Ties, Moral values, Decency and Decorum, Brotherhood, Friendship and Amity in Human society, Truthfulness, Honesty, Sincerity, Righteousness, Piety and Religiousness; Social vices; Role of Islam in eradicating social evils; Islam and Environment; Islam and the world peace.

Text Book:

1. Musa mahammad Youssef (1993). Islam and Humanities Need of it. Ministry of Waqf,SCIA,Cairo.

TVE 4103	Educational Psychology	3-0-0	Credit 3.00
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Basic concepts of psychology and their application for understanding of human behavior, particularly in the teaching learning set-up of the educational institutions and their management; principles of physical, mental and personality development; theories of learning and their application for interpretation of educational and learning problems; principles of therapeutic psychology; application of the principles of educational psychology for solution of educational management problems.

Text Books:

1. Crider, Andrew B (2012). An Introduction educational psychology.

2. Asch, M (2010). Psychology in Education.
3. Kenneth Hopkins (1997). Educational and psychological measurement and evaluation.

TVE 4125	Methods & Techniques of Teaching	3-0-0	Credit 3.00
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Principles of: learning, teaching and motivation in higher education. Introduce recent trends in teaching and learning: teacher-centred and student-centred teaching; deep level and surface level learning. Teaching methods in common use. Teaching aids and their use. Lesson planning; Information and Communication Technology (ICT) in education: what is ICT and its benefits in education system (pedagogical, administrative, professional); its impact on teaching and learning, barriers of introducing ICT in the developing country. Classroom management: discipline in the workshop (lab) and classroom.

Text Books:

1. Wadhwa, S. (2000). Text: The psychology of teaching.
2. Bhat, B.D (2011). Modern method of teaching: concepts & technique.
3. Kourilsky, Marilyn (2012). Effective teaching.

TVE 4126	Methods & Techniques of Teaching Lab	0-0-2	Credit 1.00
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Practical work related to TVE 4125.

TVE 4151	Technical & Vocational Education Ethics & Society	3-0-0	Credit 3.00
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Ethics and professionalism; ethics, values, and moralities in TVE for the world of work; moral reasoning and codes of ethics; commitment to safety; workplace responsibilities and rights; environmental and job place ethics; engineering ethics and technological progress; honesty and codes of ethics for TVE managers in the society.

Text Books:

1. Mike W. Martin, Roland Schinzinger (2005). Ethics in Engineering. International edition, McGrawHill, 4th edition, ISBN 0-07-283115-4.
2. Collins, H. (1998). European vocational education system
3. Rashtriya, T. (2000). Vocational education
4. Rao, V.K. (2011) Vocational education.

Second Semester

Hum 4232	Arabic-II	0-0-2	Credit 1.00
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Reading comprehension, general exercise and revision of lessons; Nouns; singular, plural and various modifications; Use of verbs and pronouns, new words, different parts of speech.

Text Book:

1. John Eastwood (2002). Oxford Practice Grammar. Oxford University Press. 2nd edition.

Hum 4234	English-II	0-0-2	Credit 1.00
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Listening & Speaking: Listening to dialogues, watching movies/documentaries; Conversations, Picture description, storytelling, etc.; Conversational traits. Reading: Reading for comprehension; Intensive reading; Time reading; Strategy-based reading; Reading comprehension exercises. Writing & Grammar: Conditionals, sentence change; Passivation, Reported speech; Modality, Prepositions; Adverbs, adjectives; Embedded and super-ordinate clauses, operators; Letters and paragraphs; Writing letters, e-Mails, reports, stories on familiar and unfamiliar subjects. Miscellaneous: Vocabulary development; Contextualized vocabulary items; Word-games; Culture in language; Tenses and usage.

Text Book:

1. John Eastwood (2002). Oxford Practice Grammar. Oxford University Press. 2nd edition.

Hum 4237	Islamic History, Science & Culture	3-0-0	Credit 3.00
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Life and works of the Prophet Muhammad (SM). Caliphate of the pious caliphs. Islamic Culture & Islamic festivals; Islamic Arts and Crafts; Importance of acquiring knowledge of Science and Technology in the light of the Holy Quran and the Sunnah; Relation between Science & Technology and Islam; Scientific indications in the Holy Quran, Impact of Science, Technology and Religion on Society and Social Development. Contributions of Islamic Civilization and Scientific achievement on the development of modern Science and Technology.

Text Book :

1. Farid,Ahmad (1995). An Encounter with Islam. Islamic Foundation, Dhaka, Bangladesh.

TVE 4239	Principles of Technical & Vocational Education	3-0-0	Credit 3.00
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Concept, nature and scope of vocational and technical education; socio-economic needs and psychological bases; historical development; problems of vocational technical educational organization, administration, instruction and evaluation of vocational and technical education.

Text Book:

1. Collins, H. (1998). European vocational education system
2. Rashtriya, T. (2000). Vocational education
3. Rao, V.K. (2011) Vocational education.

TVE 4258	Observation and Practice Teaching	0-1-4	Credit 2.50
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Introduction to the practical role of a teacher; preparation for teaching a specialized subject.

TVE 4259	Educational Technology	3-0-0	Credit 3.00
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Meaning and concept of Educational Technology; meaningful integration of technology; objectives of educational technology; approaches of educational technology; Technology and learning today and tomorrow; scope and significance of educational technology; hardware instructional aids; software instructional aids; programmed learning or instruction; learner controlled instruction (LCI); Personalized system of instruction (PSI); computer assisted and computer managed instructions.

Text Book:

1. Timothy J. Newby, Donald A. Stepich, James D. Lehman, James D. Russell, Anne Ottenbreit-Leftwich (2011). Educational Technology for Teaching and Learning, 4th edition, Pearson, ISBN-13:978-0-13-705159-5.
2. Timothy J. Newby, Donald A. Stepich, James D. Lehman, James D. Russell (2000). Instructional Technology for Teaching and Learning, Designing Instruction, Integrating Computers, and Using Media , 2nd edition, Merrill, ISBN 0-13-914052-2.
3. Timothy J. Newby, Donald A. Stepich, James D. Lehman, James D. Russell (2000). Instructional Technology for Teaching and Learning, Designing Instruction, Integrating Computers, and Using Media , 2nd edition, Merrill, ISBN 0-13-914052-2.

TVE 4260	Educational Technology Lab	2-0-0	Credit 1.00
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Lab works/practice related to TVE 4259.

TVE 4235	Educational Measurement and Evaluation	3-0-0	Credit 3.00
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Test, Measurement, Evaluation, Formative and Summative Assessment, Subjective and objective tests, Criteria of good test, Instructional objectives, General and behavioral objectives, Taxonomy of objectives. Test construction in different domains. Definition of statistics; Use of Statistics in Education, Frequency distribution, measures of central tendency, measures of variability / dispersion; Normal distribution curve and TVE use; Standard scores, percentiles, bivariate and multivariate, measures of relationship; Correlation coefficient, standard error of estimate; Regression analysis.

Text Books:

1. Garrett (1999). Statistics in psychology and education
2. Gibbs, G (2000). 53 Interesting Ways to assess your students, Technical & Educational Services.
3. Loyd-Jones, L. (2011). Assessment from Principle to action. Mac Millan Educational Ltd. Swaine (1998). Measurement statistics and guidance education.

MCE Courses Contents for DTE

First Semester

MCE 4391	Refrigeration and Air-Conditioning	3-0-0	Credit 3.00
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Brief history and applications of refrigeration. Reversed Carnot cycle, use of vapour in reversed Carnot cycle. Refrigerator and heat pump. Ideal and actual vapour compression refrigeration cycles. Major components of vapour compression refrigeration systems. Cooling towers. Refrigerants and their designations, desirable properties, primary and secondary refrigerants. Absorption refrigeration systems. Comparison with vapour compression system. Basic air cycle refrigeration system, types used in aircrafts. Refrigerant flow controls, methods of flow controls. Thermoelectric refrigeration. Applications. Cascade system. Definitions of air conditioning and ventilation, applications. Psychrometrics. Definitions for psychrometric properties and their relations. Psychrometric processes. Sensible and latent heats. Psychrometric calculations for air conditioning. Ventilation requirements, calculations of ventilation loads outside and inside design conditions. Calculations of overall heat transfer coefficients for heat transmission through building structures. Heating and cooling load calculations. By-pass factor of cooling coils. Calculations of supply air quantities and cooling capacity. Selection of heating/cooling units.

MCE 4392	Refrigeration and Air-Conditioning Lab	0-0-1.5	Credit 0.75
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Conducted the Lab MCE 4392 based on the theories taught in MCE 4391.

MCE 4393	Automotive Technology	3-0-0	Credit 3.00
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Introduction to motor vehicles. Motor vehicle science, tractive effort and resistances, overturning, skidding, load transfer during braking, engine performances, efficiencies, SFC, dynamometers, Engine fundamentals, spark ignition engines, Compression ignition engines, cylinder arrangements, functions, design aspect and construction detail of engine parts. Fuel system, physical and chemical properties of motor fuels, pump, carburetors, injectors, exhaust silencer. Lubrication system. Cooling system, charging system, starter System, Ignition system. Electrical circuits in automotive vehicle, vehicle lighting and other electrical equipment. Power transmission, function, construction detail and arrangements of clutches, gear boxes, universal joints, differential mechanism, rear axle. Steering system, front wheel geometry, cornering force. Brake system and its layout, servo assisted and power brakes. Suspension systems. Automotive chassis construction detail and mounting arrangements. Body mechanisms Engine arrangements. Types and its characteristics. Heating and air-conditioning.

MCE 4394	Automotive Technology Lab	0-0-1.5	Credit 0.75
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Conducted the Lab MCE 4394 based on the theories taught in MCE 4393.

Second Semester

MCE 4491	Advanced Manufacturing Process	3-0-0	Credit 3.00
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Introduction to production processes; Classification of production processes; Metal Forming: Hot and cold working processes -rolling, forging, extrusion, swaging, wire and tube drawing. Machines and equipment for the processes. Parameters and force calculations. Fundamentals of Metal Casting, molding Processes, melting practices and furnaces, Casting defects, Sheet Metal Works and equipments, Shearing mechanism and processes like blanking, piercing, punching, trimming, etc. Forming processes like bending, cup drawing, coining, embossing, etc. Powder Metallurgy,

Different types of joining processes, metal arc or shielded metal arc welding, Submerged arc welding, Gas metal arc welding (GMAW) or MIG/MAG welding, TIG welding, Resistance welding, Theory of metal cutting; Cutting too, Cutting conditions and cutting force; Different cutting processes turning, drilling, milling, shaping, gear cutting. Fabrications of plastics; Non-conventional machining processes, accuracy of Machining, measurement of dimensions and forms. Screw thread and gear measurement, Measurement of profile surface finishing.

Text Books:

1. Kalpakjian and Schmid, “Manufacturing Engineering & Technology”, Prentice Hall, 2009.
2. R. K. Rajput, “A Textbook of Manufacturing Technology: Manufacturing Processes”, Firewall Media, 2007.
3. Gary F. Benedict, “Nontraditional Manufacturing Processes”, CRC Press, 1987.

MCE 4493	Automotive Maintenance Engineering	3-0-0	Credit 3.00
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Automotive testing methods, shop facilities, test equipment and tooling, use of ignition timing lights, compression tester, vacuum gage, electrical test meter, general principles of servicing, maintenance and repair of automotive engine and vehicles, diagnosis of engine and vehicle troubles and remedy, tuning-up, battery checking and charging; general servicing and servicing, checkup of ignition system, cooling system, lubrication system, electrical system, including their equipment. Engine overhauling, break down maintenance and repair, Accepted noise level and exhaust pollution control. Servicing checkup and repair of transmission, suspension, steering and braking system. Wheel alignment. Repair and maintenance of body mechanisms, door latches, locks, window regulators, wipers, bonnet. Denting and spray painting. Vehicle behavior, special material handling, vehicle security, vehicle inspection and testing, accidents and insurance covers. Workshop organization and management, layout of service station, garage planning. Fleet transport maintenance and repair, vehicle livery and cleaning. Estimating, costing and invoicing.

**EEE Courses Contents for DTE
First Semester**

EEE 4391	Electrical Machine 1	3-0-0	Credit 3.00
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Review of electromagnetic induction. Basic principle of a Generator and a motor. Concept of torque angle. Power flow diagram for an elementary generator and motor.
 D.C. Machines: Main constructional features, Function of brush and commutator. Armature winding systems: lap and wave windings.
 Different types of excitation. Armature reaction and methods of neutralizing armature-reaction. Losses and efficiency of D.C. machines. Determination of efficiency by practical methods.
 D.C. Motors: Torque equation, back e.m.f., factors determining speed, characteristic Curves. D.C. motor starters, speed control. Ward-Leonard method. Application of D.C. motors.
 Transformers, basic principle, construction, cooling methods, use of conservator and breather. Turns-ratio, EMF equation. Phasor diagram and equivalent circuit of a transformer on no-load and on-load. Voltage regulation, losses and efficiency. Transformer - tests.
 Auto-transformer and Instrument Transformers: (C.T. and P.T.), Parallel operation of transformers. Three-phase transformers.

Text Books:

1. Electric Machinery by A.E. Fitzgerald, Charles Kingsley, JR.
2. Electric Machinery Fundamentals by Stephen J. Chapman
3. Electric Machines: Theory, Operating Applications, and Controls by Charles Hubert

EEE 4392	Electrical Machine 1 Lab	0-0-1.5	Credit 0.75
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Experiments based on EEE 4391

EEE 4393	Electrical Measurement and Instrumentation 1	3-0-0	Credit Hours	3.00
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Measurement: Units and standards. Measurement of resistance, inductance and capacitance, A.C. and D.C. bridge methods, current, power, energy, frequency and phase difference measurement. Earth resistance measurement, measurement of cable fault location.

Measuring Instruments: Indicating instruments and their classifications, moving coil and moving iron instruments. "Clip-on" instruments; Dynamometer and thermal instruments; Vibrating reed instruments, recording instruments, Megger with applications.

Text Books:

1. A Course in Electrical and Electronic Measurements and Instrumentation. By A.K. Sawhney
2. Electronic instrumentation and measurements by David A. Bell
3. Electronic instrumentation and measurement techniques by W.D. Cooper and A.D. Helfrick

EEE 4394	Electrical Measurement and Instrumentation 1 Lab	0-0-1.5	Credit 0.75
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Experiments based on EEE 4393

EEE 4395	Electrical Power Transmission	3-0-0	Credit 3.00
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General system layout, Low voltage D.C. distribution system, A.C. distribution system, radial and ring systems, distributor aspects, sag calculations, poles and towers insulators, calculation of inductance and capacitance. Current and voltage relations on a transmission line, short lines, Medium-length lines, Long lines; cables, manufacture, laying and jointing of cables, insulation resistance and capacitance. Protection of transmission and distribution systems.

Text Books:

1. Modern power system analysis by W.D. Stevenson
2. Elements of power system analysis by I.J. Nagrath and D.P. Kothari
3. Power System Analysis by Hadi Saadat

EEE 4396	Electrical Power Transmission Lab.	0-0-1.5	Credit 0.75
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Experiments and field work based on EEE 4395.

EEE 4397	Digital Techniques 1	3-0-0	Credit 3.00
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Atomic structure, Quantum numbers, Electronic configuration, Periodic table. Properties and uses of noble gases. Different types of chemical bonds and their properties. Molecular structures of compounds. Selective organic reactions.

Different types of solution and their compositions. Phase rule, phase diagram of monocomponent system. Liquid crystals. Properties of dilute solutions. Thermo chemistry; chemical kinetics, catalysis, chemical equilibriums. Ionization of water and pH concept. Electrical properties of solution.

Text Books:

1. Digital logic and computer design by M. Morris Mano
2. Digital fundamentals by Thomas L. Floyd
3. Digital Electronics: Principles, Devices and Applications by Anil K. Maini

EEE 4398	Digital Techniques 1 Lab	0-0-1.5	Credit 0.75
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Experiments based on EEE 4397.

EEE 4381	Basic Electronics	3-0-0	Credit 3.00
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Semiconductor devices: Diode, BJT, MOSFET, their structures, characteristics, equivalent circuits, biasing circuit and principle of operations. Operational Amplifier: Differential mode of operation, common mode rejection, typical op-amp specifications (open loop gain, differential input resistance, unity gain bandwidth etc.), inverting amplifier, non-inverting amplifier, integrator, differentiator, summing amplifier, concept of active filters. Power Electronics: Silicon controlled rectifier (SCR) and its applications, half-wave and full-wave rectification, filtering, regulation with zener diode and linear regulators, Switch -mode power supplies. Transducers: Measurement of conductivity, strain, temperature, pressure, flow rate, speed and torque using transducers. Oscillators: Barkhausen criterion, sinusoidal and non-sinusoidal oscillators, applications and typical circuits.

Digital electronics: Boolean algebra and signed number representation schemes in binary, implementation of Boolean functions using various logic gates, concept of combinatorial and sequential circuits, registers and counters from functional viewpoint, concept of programmable processors and microcontrollers. Introduction to analog-to-digital and digital-to-analog data converters.

Text Books:

1. Microelectronics Circuits: Theory and Application by Adel S. Sedra, Kenneth C. Smith. Oxford University Press.
2. Digital Fundamentals by Thomas L. Floyd, Prentice Hall
3. Operational Amplifiers and Linear Integrated Circuits by Robert F. Coughlin, Frederick F. Driscoll. Prentice-Hall

EEE 4382	Basic Electronics Lab	0-0-1.5	Credit 0.75
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Experiments based on EEE 4381

Second Semester

EEE 4491	Electrical Machine II	3-0-0	Credit 3.00
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Alternators: Basic Principle, construction, EMF equation, synchronous reactance, voltage regulation and parallel operation. Synchronous motors: Basic principle, Starting methods, effect of excitation on armature current, V - curves. Three-phase induction motor: Theory of rotating magnetic field. Construction of induction motor, rotor types. Speed and slip, starting torque, speed control, performance characteristic and equivalent circuit. Single-phase induction motor: Basic principle, cross-field theory, double revolving field theory. Different methods of starting a single-phase induction motor. Amplidyne and other special motors.

Text Books:

1. Electric Machinery Fundamentals, by Stephen Chapman
2. A Textbook of Electrical Technology: Vol 2, by B.L. Theraja, A.K. Theraja.
3. Electrical Machines, Drives, and Power Systems by Theodore Wildi

EEE 4492	Electrical Machine II Lab	0-0-1.5	Credit 0.75
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Experiments based on EEE 4491

EEE 4493	Electrical Measurement & Instrumentation II	3-0-0	Credit 3.00
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Measurement: Magnetic Measurements-Ballistic galvanometer-flux meter- measurement of non-electrical quantities like temperature, pressure speed, level, flow, rate, stress, strain etc. High voltage measurement and testing, radio frequencies measurements. Effect of Instrument connection on the accuracy of measurement, care and handling of Instruments, sensitivity of Instruments. Measurement Instruments: Cathode ray oscilloscope, Q meters, extension of Instrument range. Instrument transformers, tube and transistor testers, Tachometer Stroboscope, Instrumentation amplifier, digital voltmeter and multimeters, A/D and D/A converters.

Text Books:

1. Electrical and Electronic Measurements and Instrumentation by A.K. Sawhney
2. Text-Book of Electrical Technology in S.I. Units by B.L. Theraja & A.K. Theraja
3. Electronic instrumentation and measurement techniques by W.D. Cooper and A.D. Helfrick

EEE 4494	Electrical Measurement & Instrumentation II	0-0-1.5	Credit 0.75
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Experiments based on EEE 4493

EEE 4495	Power System Analysis	3-0-0	Credit 3.00
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Basic structure of electrical power systems, Representation of power systems, Single line diagrams, Impedance and reactance diagrams, Per-unit quantities, Selection of base, Change of base Symmetrical three phase faults, Recommended procedure for short circuit calculations, Symmetrical components, Application of symmetrical components, unsymmetrical faults, single line to ground fault, Double line to ground fault. Line to line fault, Introduction to power system stability.

Text Books:

1. Modern power system analysis by W.D. Stevenson
2. Elements of power system analysis by I.J. Nagrath and D.P. Kothari
3. Power System Analysis by Hadi Saadat

EEE	4496	Power System Analysis Lab	0-0-1.5	Credit 0.75
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Experiments based on EEE 4495

EEE	4497	Digital Techniques II	3-0-0	Credit 3.00
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Sequential logic system: Flip-Flops, clocked RS, JK, Master Slave JK, D-type, T-type, Flip-Flops, Flip-Flop Design. Sequential logic Registers: Different types of Registers and their applications. Counters and their simplified design. Timing Circuits: Application of logic gates in Timing Circuits, OPAM-application in timing circuits-use of IC-555 as timing circuits.

Text Books:

1. Digital logic and computer design by M. Morris Mano
2. Digital fundamentals by Thomas L. Floyd
3. Digital Electronics: Principles, Devices and Applications by Anil K. Maini

EEE 4498	Digital Techniques II Lab	0-0-1.5	Credit 0.75
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Experiments based on EEE 4497.

CSE Courses Contents for DTE First Semester

CSE 4173	Introduction to Database Management System	3-0-0	Credit 3.00
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Overview of database management systems; DBMS file structures; introduction to the relational model; relational algebra, normalization and relational design; ER modeling, object-oriented modeling, advanced features of the relational model; Database Design Language; the hierarchical model alternative data models; physical database design; fourth-generation environment; database administration, database recovery, distributed databases and current trends in the field. Relational query languages: SQL; embedded SQL in a third-generation language (COBOL, C or C++). Transaction management; concurrency control.

Text Books:

1. Database System Concepts, Author: Abraham Silberschatz, Henry F. Korth, S. Sudarshan the McGraw-Hill Companies Ltd.
2. Database System, Author: C.J. Date
3. Fundamentals of Database systems, Author: Elmasri R and Navathe S B, Benjamin-Cummings, 1994.

CSE 4174	Introduction to Database Management System Lab	0-0-1.5	Credit 0.75
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Sessional works based on CSE 3173

Text Books:

1. SQL,PL/SQL Author : Ivan Bayross
2. Access 2000 Developers Handbook , Author: Litwin, Paul
3. Teach Yourself Database Prog with Visual basic 6 ,SAMS

CSE 4175	Computer programming	3-0-0	Credit 3.00
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Problem solving techniques, algorithm specification and development, Programming style, Program design methodologies. Detail and in depth of array, function, pointer, structures, union, files in detail, dynamic memory allocation, sound, graphics, graphics with video memory. Introduction to Object Oriented Programming, encapsulation, inheritance, polymorphism of classes.

Text Books:

1. SOS Programming with C, Author: Gottfried
2. Complete Reference Turbo C/C++, Author: Herbert Schildt
3. C++: How to program, Author: Deitel H M and Deitel P J

4. Programming Challenges: The programming Contest Author: Steven S. Skiene, Miguel A. Reville.

CSE 4176	Computer programming Lab	0-0-1.5	Credit 0.75
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Sessional works based on CSE 4175.

CSE 4177	Computer Organization and Architecture	0-0-3	Credit 3.00
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Contents: Components of a computer system: processors, memory, secondary storage devices and media, and other input output devices. Processor organization: registers, buses, multiplexers, decoders, ALUs, clocks, main memory and caches. Information representation and transfer; instruction and data access methods; the control unit: hardwired and microprogrammed; memory organization, I/O systems, channels, interrupts, DMA. Von Neumann SISD organization. RISC and CISC machines.

Text Book:

1. Computer Architecture and Organization, Author: Hayes J 2nd. Edition McGraw-Hill 1992.

Second Semester

CSE 4273	System Analysis and Design	3-0-0	Credit 3.00
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System development methodologies and life cycle; tools, approaches and role of design; planning and problem definition; evaluation and feasibility study; describing process and data; quality and testing; project management; design of user interface, programs, files and databases; control and security. Basic design and architecture of distributed systems; data communication requirements; implementation and maintenance. Analysis tools: information gathering, interview and questionnaire; organization charts; data flow diagrams, documentation standards; data dictionary, decision tree, decision tables; prototyping; CASE tools.

Text Books:

1. Systems Analysis and Design, Author: Elias M. Awad, Galgotia Publications Private Limited.
2. System Analysis and Design Methods Author: Bently and Barlow 3rd. Edition, Irwin, 1994

CSE 4274	System Analysis and Design Lab	0-0-1.5	Credit 0.75
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Sessional works based on CSE 4273

CSE 4277	Data Structures and Algorithms	3-0-0	Credit 3.00
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Data Structures: Basic data structure concepts, notations and complexities, Linear and non-linear data structures: Stack, Queue, Linked Lists, Tree, and Graph etc. Data structure operations such as searching (linear search, Binary search etc), sorting (Quick sort, Merge sort, Binary search trees, Heap sort etc), insertion and deletion operations on various data structures; Algorithms: Complexity of Algorithms, BFS, DFS on trees and graphs, Minimum spanning trees, shortest path algorithms, Dynamic and Greedy Approach.

Text Books:

1. Data Structures: Author: Seymour Lipschutz, Schaum's Outline Series
2. Introduction to Algorithms, Author: Cormen, Leiserson and Rivest.

CSE 4278	Data Structures and Algorithms Lab	0-0-1.5	Credit 0.75
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Sessional works based on CSE 4277.

CSE 4279	Data and Telecommunications	3-0-0	Credit 3.00
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Basic concepts: Concepts and Terminology, Data representation, Data flow, Networks and network models, Protocol and standards, OSI reference model, TCP/IP protocol suite.

Data and signals: Analog and Digital data, Time and frequency domain concepts; Transmission impairment; Noisy and Noiseless channel.

Digital and Analog Transmission: Line coding scheme; Pulse code modulation; Delta Modulation; Amplitude shift keying; Frequency shift keying; Phase shift keying; Amplitude, Frequency and Phase modulation.

Multiplexing: Frequency-division multiplexing; Wavelength-division multiplexing; Time-division multiplexing, spread spectrum; Frequency hopping and Direct sequence spread spectrum.

Multiple Access Techniques: Random Access (ALOHA, CSMA, CSMA/CD, CSMA/CA), Controlled Access (Reservation, Polling, Token Passing) Channelization (FDMA, TDMA, SDMA, OFDMA, CDMA)

Transmission Media: Guided media-Twisted pair cable; Coaxial cable; Fiber-optic cable; Unguided media- Radio wave; Microwave; Infrared and satellite communication.

Switching Network: Circuit switching network; Space and Time division switching; Control signaling; Soft switch architecture; Packet switching; Packet switching technique; Datagram and virtual circuit packet switching.

Error Detection and Correction: Types of error; Block coding; Linear block codes; Hamming code; Cyclic code Convolution codes; Trellis code.

Data link Control Protocols: Flow control; Error control; High level data link control.

Mobile communication: GSM Architecture, CDMA Architecture Cellular concept: Frequency reuse; Handoff; Channel assignment; Co-channel and adjacent channel interference; Cluster size; Cell size; Coverage; Capacity; Cell splitting, Sectoring, Power control, Frequency hopping.

Radio Propagation and channel modeling: Signal propagation mechanisms; Multipath propagation characteristics; Signal fading; Pathloss; Propagation models: Radio wave propagation modeling; Free space propagation model; Radio wave reflection: Ground reflection model; Diffractions; Scattering; Deterministic model; Outdoor propagation model: Okumura model, Hata model;

Text Books:

1. Data Communication and Networking, Author: Behrouz A. Forouzan
2. Wireless communication Author: Rappaport
3. Wireless & Mobile Network Architectures Author: Yi bing Lin
4. Principles and Applications of GSM, Author: Vijay K. Garg, Joseph E. Wilkes.