UNIVERSITY OF NIGERIA, NSUKKA
FACULTY OF VOCATIONAL AND TECHNICAL EDUCATION
DEPARTMENT OF INDUSTRIAL TECHNICAL EDUCATION
POSTGRADUATE PROGRAMMES IN INDUSTRIAL TECHNICAL EDUCATION

POSTGRADUATE DIPLOMA IN TECHNICAL EDUCATION

PHILOSOPHY:

Postgraduate Diploma in Technical Education is made available to youths and adults who are already at work but are motivated to update or upgrade their present occupational skills or learn new skills and extended knowledge. Based on the strength of this philosophy, most of the people who will be admitted into the programme are already employed in teaching and technology education administration. Therefore, the Postgraduate Diploma in Technical Education will make them more effective in their respective employments.

The M.Tech and PhD Programmes of the Department of Industrial Technical Education are intended to prepare professionally qualified individuals who can assume leadership positions in government, secondary schools, colleges of education, polytechnics, universities, industry and commerce. The Federal Government of Nigeria has, since the introduction of the National Policy on Education, placed emphasis on vocational and technical education. This emphasis has led to the establishment of College of Education (Technical) in various parts of the country and the introduction of programmes of technical and vocational education in several polytechnics and universities in Nigeria. All such programmes require well-trained lecturers with postgraduate qualifications in vocational and technical education.

OBJECTIVES:

The general objectives of the programme are to provide students with adequate knowledge, skills and attitudes in various areas of industrial technical education. The specific objectives of the programme are as follows:

1. To provide persons in teaching and administrative positions in technical and vocational institutions who do not possess any formal professional qualifications in technical education with the required body of knowledge and instructions.
2. To provide foundations for higher degrees for graduates in related fields lacking professional qualifications in technical and vocational education but desire advancement in technical and vocational education as a career.
3. To ensure effectiveness in institutions and administration in technical and vocational institutions by equipping the professionally unskilled persons with the theories, practices and philosophies of technology education.

The postgraduate programmes (M.Tech and Ph.D) of the Department of Industrial Technical Education are intended to:

1. Equip students with professional competencies that will enable them serve in leadership positions in secondary schools, government, colleges of education, polytechnics and universities;
2. Increase the technical knowledge and skills of students so that they can keep abreast of technological development in their areas of specialization; and

Develop research skills in students and teach them to apply such skills in the solution of problems in vocational and technical education.

SCOPE:

The Postgraduate Diploma in Technical Education (Industrial Technical Education) Programme is designed to cover foundational studies in vocational and technical basic courses in general education. The specific areas of technical education (with various options) covered by the programme are as follows:

Building/ Woodwork Technology
Electrical/ Electronic Technology
Metalwork/ Automobile Technology

The M. Tech and Ph.D Programmes of the Department of Industrial Technical Education are designed to offer courses in three different areas of Industrial Technical Education.

ADMISSION REQUIREMENTS

POSTGRADUATE DIPLOMA IN TECHNICAL EDUCATION (PGDTE)

(i) Bachelor’s degree with at least a third class honours with GPA not less than 2.00 on a 5-point scale or HND with Upper Credit in Mechanical Engineering, Civil Engineering, Building Technology, land survey, Electrical Engineering, Industrial Technical Education, Electronic Engineering, Architecture, Auto Mechanics, Metalwork Technology, Wood Technology, Electrical/Electronic Technology and Plastic Technology.

(ii) Candidates who hold other qualifications considered equivalent to the above and acceptable to the Board of Postgraduate Studies and Senate of the University may be admitted

Master of Technology Education (M. Tech)

The following categories of candidates may be admitted on application

(a) Graduates of the University of Nigeria, Nsukka or of other approved universities who have obtained at least a second-class honours degree or its equivalent in:

i. Building/ Woodwork Technology
ii. Electrical/ Electronic Technology
iii. Metalwork/ Automobile Technology

(b) Graduates of related disciplines such as Mechanical Engineering, Civil Engineering, Building Technology, Electrical Engineering, Electronic Engineering Architecture, Auto Mechanics, Metal Technology, and Wood Technology, Plastic Technology, who have obtained a second class honour degree or its equivalent, and who have in addition a Post-Graduate Diploma in Technical Education (PGDTE), passed at credit level and above

(c) Holders of the Higher National Diploma who have in addition obtained a Post-Graduate Diploma in Technical Education at credit level or above

(d) Other Graduates of the University of Nigeria, or of other recognized universities whose detailed academic records are considered satisfactory by the Senate of the University of Nigeria.

Doctor of Philosophy (Ph.D)

(a) Candidates who possess a Masters or Higher degree in any area of Industrial Technical Education from the University of Nigeria or other approved universities may be admitted into the Doctor of Philosophy Programme provided that they obtained a minimum GPA of 3.50 on a 5-point scale or 3.00 on a 4-point scale and that a satisfactory research work formed part of the Master's degree

(b) Candidates who hold other qualifications may be admitted into the Doctor of Philosophy programme if their detailed academic records are satisfactory to the Senate of the University.

MODE OF STUDY:

1. **PGDTE:** The mode of study is by course-work and project.
2. The Master of Industrial Technical Education degree will be prosecuted through course work and project, where course work predominates over research and constitutes not less than two-thirds of the total credit load
3. **Doctor of Philosophy:** The Doctor of Philosophy degree will be prosecuted through course work and doctoral research thesis.

DURATION OF PROGRAMME AND RESIDENTIAL REQUIREMENTS

The maximum and minimum duration of Postgraduate Programme shall be:

(a) **PGDTE:**

Full-time: The minimum duration = Two Semesters
The maximum duration = Four Semesters

Part-time The minimum duration = Three Semesters
The maximum duration = five Semesters

(b) **Master's Programme:**

Full-time: The minimum duration = Three Semesters
The maximum duration = Five Semesters

Part-time: The minimum duration = Six Semesters
The maximum duration = Eight Semesters

(c) **Ph.D Programme:**

Full-time: The minimum duration = Six Semesters
The maximum duration = Ten Semesters

Part-time: The minimum duration = Eight Semesters
The maximum duration = Twelve Semester

REQUIREMENTS FOR GRADUATION

PGDTE Programme:

i) To be awarded the PGDTE in industrial technical education a student must have taken and passed the prescribed number of required courses from the approved list, a total of 30 units as follows:

Core courses	30 units
Project report	4 units

Total	34 units

ii) In all cases, PGDTE students must write and submit to the department a project report duly supervised by a lecturer in the department whose qualifications are not below the Ph.D. Such project report must be sent to an external examiner nominated by the department and appointed by Senate for that purpose.

M.Tech. Programme:

i) To be awarded the M.Tech degree a student must have taken and passed the prescribed number of compulsory and required courses selected from the approved list, a total of 33 units as follows:

Core courses	27 units
Project report	6 units
Total	33 units

ii) In all cases, M. Tech students must write and submit to the department a project report duly supervised by a lecturer in the department whose qualifications are not below the Ph.D. Such a report must be sent to an external examiner nominated by the department and appointed by Senate for that purpose.

Ph.D. Programme:

i) To graduate, all the Ph.D. candidates must take and pass all the requisite courses as prescribed in the Ph.D course list below, a total of 30 units as follows:

Core Courses	38 units
Thesis	12 units
Total	50 units

ii) Every Ph.D. candidate must submit a thesis on a chosen and approved topic, supervised by a member of staff whose qualification is not below the Ph.D, and who is not lower than Senior Lecturer in rank.

iii) The Ph.D. thesis must be defended before an external examiner dully nominated for that purpose and appointed by Senate.

LIST OF APPROVED SUPERVISORS

Professor E.O. Anaele B.Sc, M.Ed, & Ph.D (Nigeria)	Building/Woodwork Technology

Professor E.O. Ede B.Sc, M.Ed & Ph.D (Nigeria)	Automobile/Metalwork technology
Prof. S.C.O.A. Ezeji B.Sc (Nigeria), M.Sc & Ph.D (Florida)	Building/woodwork Technology
Dr. T.C. Ogbuanya B.Sc, M.Ed & Ph.D (Nigeria)	Electrical/Electronic Technology
Dr. Jimoh Bakare PGDTE, M.Ed & Ph.D (Nigeria)	Electrical/Electronic Technology
Dr. H.O. Omeje B.Sc, M.Ed, & Ph.D (Nigeria)	Building/Woodwork Technology
Dr. I.B. Ohanu B.Sc, M.Ed & Ph.D (Nigeria)	Electrical/Electronic Technology

JOB OPPORTUNITIES

Students who successfully complete the postgraduate degree programmes of the Department of Industrial Technical Education may be employed in the following positions:

(a) Secondary school principals, vice-principals and teachers of technical and vocational subjects.

(b) Administrators and managers of training programmes in industries.

(c) Lecturers in N.C.E programmes in Vocational and Technical Education in Colleges of Education and Polytechnics.

(d) Lecturers in degree programmes in Vocational and Technical Education Programmes in Universities.

(e) Trainers, technologists, or technical personnel in the relevant industries

AREAS OF SPECIALIZATION

The Department of Industrial Technical Education offers M.Tech. Programmes in various areas of specialization as specified below. Students may specialize in any of these areas at both PGDET, Masters and PhD levels:

Building/ Woodwork Technology
Electrical/ Electronic Technology
Metalwork/ Automobile Technology

Stress Areas	Stress Codes
Vocational Technical Education (no option)	0
Industrial Technical Education	1
Building / Woodwork	2
Electrical/ Electronic	3
Metalwork/ Automobile	4
Dissertations/ Project / Thesis	9

POSTGRADUATE DIPLOMA IN TECHNICAL EDUCATION (PGDTE)

First Semester

Course No.		Course Title	Units
VTE	0501	Foundations of Technical Education	2
VTE	0503	Vocational Guidance	2
VTE	0505	Administration of Technical Education	2
VTE	0507	Measurement & Evaluation in Technical Education	2
VTE	0509	Statistics in Technical Education	2
VTE	0511	Research Methods Technical Education	2
EDU	0511	Educational Psychology I	2
EDU	0521	Curriculum Theory and Planning	3
			17

Second Semester (Industrial Technical Education)

VTE	0504	Practical Teaching in Industrial Technical Education	3
ITE	0510	Curriculum Development in Industrial Technical Education	2
ITE	0514	Methodology in Industrial Technical Education	2
ITE	0516	Seminar in Industrial Technical Education	2
EDU	0512	Educational Psychology II	2

Options: **Two units of course must be taken from the following**

ITE	0520	Building Construction/Woodwork/Basic Technology	2
ITE	0530	Electricity/Electronics/Basic Technology	2
ITE	0540	Metalwork/Auto Mechanics/Basic Technology	2
ITE	0590	Project	4
			17

COURSE DESCRIPTION FOR POSTGRADUATE DIPLOMA IN TECHNICAL EDUCATION

VTE 0501 Foundations of Technical Education

Philosophical, sociological, historical and economic foundations and comparative analysis of technical education, content, scope and objectives of vocational education and national development, professional opportunities in vocational and technical education

(2 units)

ITE 0510 Curriculum Development in Industrial Technical Education

Major components of curriculum in vocational education, Sources and factors in curriculum planning in vocational education, Historical trends in curriculum revision and innovation in technology education in Nigeria; steps in curriculum development, Curriculum evaluation – roles procedure, stages and evaluation of instruments in technology education, A review of syllabuses of secondary school vocational subjects related to course of study.

(2 units)

VTE 0503 Vocational Guidance

An introductory course in the principles and practices of vocational guidance. Emphasis is on problems in schools. Historical, philosophical, psychological and socio-economic foundations of the guidance movements and course in career education.

(2 units)

VTE 0504 Practical Teaching in Technical Education

Students are exposed to basic principles and procedures of practical teaching in vocational subjects including micro-teaching; participate in micro-teaching before the actual field practical teaching; actual field practical teaching of vocational subjects in post-primary institutions for a period of at least 6 weeks.

(2 units)

VTE 0505 Administration of Technical Education

Study of the philosophical, historical, social and psychological foundations underlying the organization, administration, supervision and teaching of vocational and practical arts education, examination of existing patterns in Nigeria.

(2 units)

VTE 0507 Measurement and Evaluation in Technical Education

Theories and approaches to evaluation in technology education, importance of objectives and types of objectives, Norm reference and criterion referenced evaluation, cognitive, affective domain and psychomotor domain. Essay tests, objective tests and performance tests, test validity and reliability, test administration and evaluation. Product and process evaluation in technology education and evaluation of skills in technology education

(2 units)

VTE 0509 Statistics in Technical Education

Introductory statistical concepts, vocabulary and symbols. Principles and application of sampling and inference frequently used in reporting empirical research in general and vocational education, calculations and application of statistics in technical education

(2 units)

VTE 0511 Research Methods in Technical Education

Techniques of empirical study including designing various types of study; methods of data collection; data analysis, simple ways of testing hypotheses and methods of writing research proposal and research reports.

(2 units)

VTE 0514 Methodology in Industrial Technical Education

Applications of the principles of curriculum and course construction, attentions to specialized methods of teaching and the measurement techniques appropriate to technical education, planning of teaching laboratories and instructional materials.

(2 units)

VTE 0516 Seminar in Industrial Technical Education

A consideration, identification and examination of some of the major issues presently facing Nigerian educational authorities regarding the role and nature of various technical vocational education and training under formal and non-formal settings. Instructional problems of teachers and students' problems in choosing careers in vocational and occupations subjects will be considered

(2 units)

ITE 0520 Building Constructions/Woodwork/Basic Technology

Type of timber; sawing, conversion, seasoning, quality and defects of timber. Veneer and manufactured boards, woodwork joints. Woodworking machines, machine preparation of timber, hand tools – planes, saws drills and shapers. Woodwork project. Types of walls; manufacture of wall materials; doors, windows, lintels, column and beams; staircase and roofs; types and functions of roofs; parts of roofs; roofing materials; and roofing methods. Basic technology concepts, scope, principles and applications should be highlighted. Emerging technologies in various technological fields, challenges and adaptations should be treated.

(2 units)

ITE 0530 Electricity/Electronics/Basic Technology

Introduction to power systems and electric energy transmission, general structure of electrical power system relations in a transmission line, regulation and losses standard and safety. Transformers and ac/dc machines and their operational principles, Circuit models for transformers and DC machines, Transistor as an amplifier, biasing arrangements, classes of amplifier (A, B and C), push-pull and complementary circuits, amplifier coupling methods, operational amplification, impedance matching, Integrated circuits, field effect transistors, unijunction transistors, measuring instruments – oscilloscope, ammeter, voltmeter, multi-meter and transistor tester. Basic technology concepts, scope, principles and applications should be highlighted. Emerging technologies in various technological fields, challenges and adaptations should be treated.

(2 units)

ITE 0540 Metalwork/Auto-Mechanics/Basic Technology

Electrical distribution system – generating stations, (hydro-electric, steam, nuclear and diesel), transmission lines and system, distribution system, circuit breakers, transformers and substations. The automobile engine – main components and their functions. Principles of operation of the two stroke and 8 cylinders, diesel and petrol engines, crank arrangement and firing order, verge operating mechanism, fuel and exhaust system, engine lubrication – reason for lubrication, types of lubricants and methods of lubrication, basic technology concepts, scope, principles and applications should be highlighted. Emerging technologies in various technological fields, challenges and adaptations should be treated.

(2 units)

ITE 0590 Project

Independent investigation of topics pertinent to the development of practical aspects of technical vocational education and training in Nigeria. A report of the study is required.

(4 units)

M.Tech PROGRAMME

First Semester

Course No.		Course Title	Units
VTE	501	Theories & Administration of Technical Education	3
VTE	503	Research Methods in Technical Education	3
VTE	505	Curriculum Development in Technical Education	3
VTE	507	ICT in Vocational & Technical Education	3
ITE	511	Facilities Planning in Industrial Education	3
PGC	601	Research Methodology and Application	3
			18

Second Semester

Course No. Course Title

Options

OPTIONS

Six units of courses must be chosen from options A, B & C

A. BUILDING CONSTRUCTION TECHNOLOGY

ITE	520	Construction Management	3
ITE	522	Building Materials Science	3
			6

B. ELECTRICITY/ELECTRONICS TECHNOLOGY

ITE	530	Workshop in Electronics Technology	3
ITE	532	Electrical Electronics Instruments and Measurements	3
			6

C. MECHANICAL TECHNOLOGY

ITE	540	Industrial Design Technology in Metal/Automobile	3
ITE	542	Automobile Mechatronics	3
			6

Third Semester

Course No.		Course Title	Units
ITE	513	Seminar in Industrial Technical Education	3
ITE	590	Thesis	6
			9

Grand Total = 33

COURSE DESCRIPTION FOR M.TECH DEGREE PROGRAMME

VTE 501 Theories and Administration of Technical Education

Vocational and Technology Education theories, and processes that have shaped vocational/technology education, evaluation of the basic theoretical concepts, self-concept, personality concepts, environmental and self-realization concepts relating to vocational/technology education, The concept of policy, institutions in educational policy formulation; policy analysis tools; issues in Nigerian Educational Policy and Vocational/Technical Education, principles and approaches in vocational/technology education administration and supervision, administration and supervision of secondary and tertiary vocational education institutions.

(4 units)

VTE 503 Research Methods in Technical Education

Methodologies and procedures in Vocational/Technical Education research; problems formulation - use of problem tree and solution tree analysis; research objectives, questions and hypothesis; research designs, methods of data collection, development of instrument for data collection, thesis, proposal and reporting, statistical techniques applicable to research in Vocational/Technical Education; Descriptive techniques and inferential statistics such as t-test, analysis of variance (ANOVA), analysis of covariance (ANCOVA), regression analysis etc., non-parametric statistical techniques.

(3 units)

VTE 504 Evaluation in Vocational/Technical Education

Theories and approaches to evaluation in Vocational Education, current methodology in evaluation, such as criterion-referencing, cost benefit analysis, cost effectiveness, Programme Evaluation and Review Techniques (PERT)

(2 units)

VTE 505 Curriculum Development in Vocational & Technical Education

Selection and organization of instructional materials for technology education courses, study of current curriculum practices, concepts and trend in the field of technology education, curriculum designs in different occupational fields of technology education, principles underlying curriculum research, development, and improvement.

(2 units)

VTE 506 Fundamentals of Vocational Enterprise Development

Developing business centres, functions of business development centres, sources of funding and start up capital to set up an enterprise, registration of new business, vision, mission, scope, activity areas, partnerships and collaboration of BDCs.

(3 units)

VTE 507 ICT in Vocational/Technical Education

Computer literacy, principles and general application of information and communication Technology in Vocational Education Programmes, ICT as curriculum content, instructional delivery tools, evaluation/assessment tools etc. Internet services and uses of e-learning and e-teaching concepts, instructional methods and materials for ICT application

(3 units)

ITE 511 Facilities Planning in Industrial Technical Education

Problems related to the planning, preparation and utilization of facilities in Industrial Technical Education, identifying and specifying facilities, equipment and instructional materials needs.

(3 units)

ITE 513 Seminar in Industrial Technical Education

Analysis and evaluation of current issues and problems in industrial technical education, students are required to write and present a 20 page paper in any important issues or problems in industrial technical education

(3 units)

ITE 522 Construction Management in Industrial Technical Education

Timber products, wood processing equipment and procedures, paper manufacture, application of wood in the design and construction of building, bridges and boats, construction industry bye-laws; the construction team; problem of the construction industry; health and safety regulations, construction management strategies.

(3 units)

ITE 524 Building Materials Science

Evaluation of quality of building materials, materials for restoration, structural mechanics, heating/ventilating buildings

(3 units)

ITE 530 Workshops in Electronics Technology

D.C. generators and motors, AC generators and motors, single phase and three phase transformers, rewinding and servicing of generators, transformers and motors, practical experiences in the electronic laboratory leading to the development of skills in the design, construction and testing of electronic circuits and equipment.

(3 units)

ITE 532 Electrical/Electronic Instruments and Measurement

Absolute and secondary measuring instruments, indicating, recording and integrating instruments, analog and Digital Instruments, testing and measuring instruments, difference between analog and digital instruments, functions of various types of testing and measuring instruments, torques in measuring instruments, parts of measuring instruments, relevance of measuring and testing instruments in electrical/electronic technology field, oscilloscopes and other modern/recent meters, meter movement and converting basic meter to DC Ammeter, converting Basic meter to DC Voltmeter, reliability of testing and measuring meters and their components, how to make use of measuring meters/instruments for maintenance of electric circuits, cares and maintenance of testing and electronic measuring instrument, construction of a simple meter

(3 units)

ITE 542 Industrial Design Technology in Metal/Automobile

The design process in industries, presenting design ideas, making design; prototypes production and testing, design and construction of simple tools and equipment using really available materials

(3 units)

ITE 544 Automobile Mechatronics

Automobile mechatronic equipment, automobile mechanical components, electronic component and computer components, the roles of sensor and actuators in signal transfer and utilization

(3 units)

ITE 590 Research Project
Supervised independent investigation of topics in the areas of vocational and technical education/ industrial technical education and a project is required.

(6 units)

Ph.D in PROGRAMME
First Semester

Course No.		Course Title	Units
VTE	601	Emerging Issues & Innovations in Vocational & Technical Education	3
VTE	603	Enterprise Development in Vocational & Technical Education	3
VTE	605	Proposal and Grant Writing in Vocational & Technical Education	3
PGC	701	Synopsis and Grant Writing	3
			12

2nd Semester

ITE	610	Doctoral Seminar in Industrial Technical Education	4
ITE	612	Advanced Curriculum Studies in Industrial Technical Education	4
			8

3rd Semester

Six units of courses must be chosen from any of the options A, B, C

A. BUILDING/WOODWORK TECHNOLOGY

ITE	621	Emerging Technologies in Building Construction	3
ITE	623	Building Regulations and Quality Assurance	3
			6

B. ELECTRICAL/ELECTRONICS TECHNOLOGY

ITE	631	Modern Communication Systems	3
ITE	633	Emerging Technologies in Electrical/Electronics	3
			6

C. MECHANICAL/AUTOMOBILE TECHNOLOGY

ITE	641	Production in Mechanical Technology	3
ITE	643	Research and Design in Metal/Automobile Technology	3
			6

4th Semester

A. BUILDING/WOODWORK TECHNOLOGY

ITE	624	Wood Processing/Problem Solving in Building/Wood Tech.	3
ITE	626	Advanced Designing in Building Technology	3
			6

B. ELECTRICAL/ELECTRONICS TECHNOLOGY

ITE	634	Distribution Automation	3
ITE	636	Consumer Electronics Issues & Problems	3
			6

C. MECHANICAL/AUTOMOBILE TECHNOLOGY

ITE	644	Production and Management in Metal/Automobile Industries	3
ITE	646	Computer Numerical Controlled Machines in Metalwork/Automobile	3
			6

5th and 6th Semester

VTE	690	Thesis	12
Grand Total			**44**

COURSE DESCRIPTION FOR Ph.D IN INDUSTRIAL TECHNICAL EDUCATION

PGC 601 Research Methodologies and Application of ICT in Research (Masters Degree Course)

In-dept research work aimed at acquiring full knowledge and presentation in scholarly writing of the concepts, issues, trends in the definition and development of the study area from African and Western perspectives. Major steps in research: Selection of problem, Literature review, Design, Data collection, analysis and interpretation, conclusions. Study of various research designs, Historical, Case studies, surveys, descriptive, cross sectional experimental, etc. Analysis, surveys and synthesis of conceptual and philosophical foundations of different disciplines. Identification of research problems and development of research data and the format for presenting research results (from designing the table of contents to referencing, bibliography and appendix). Data analysis and result presentation in different disciplines using appropriate analytical tools. Methods of project/dissertation writing. Application of appropriate advanced ICT tools relevant in every discipline for data gathering, analysis and result presentation. Essentials of spreadsheets, Internet technology, and Internet search engines. All registered Masters Degree students must attend a solution based interactive workshop to be organised by the School of Postgraduate Studies for a practical demonstration and application of the knowledge acquired from the course, conducted by selected experts.

ITE 612 Doctoral Seminar in Technical Education

Analyses, discussions and presentation of pertinent issues in technology teacher education with general emphases on vocational education and particular references to the various specializations in Agricultural Education; Business Education; Computer Education; Home Economics Education and Industrial Technical Education.

(4 units)

VTE 603 Enterprise Developments in Industrial Technical Education

Productivity theories and entrepreneurial developments with emphasis on the management of enterprises and the development and marketing of products, application of vocational skills in enterprise development and production of consumer products, feasibility study and development of business plans, crafting vision and mission statements, logical and legal frameworks for business enterprise, management structures and operations in business management, students and community engagements in business enterprises, monitoring and evaluation of business enterprises.

(3 units)

ITE 614 Advanced Curriculum Studies in Industrial Technical Education

Identification and examination of curriculum problems and issues in various areas of Technical education, application of various curriculum principles and framework, development of curricular for various technology areas, curriculum innovations and practical applications in curriculum improvement. Candidates will be expected to deliver one seminar in this course.

(3 units)

VTE 605 Proposal and Grant Writing in Technology Education

Procedures in writing research proposals, writing styles, chapter, citation, organization, referencing, etc. Concept and types of grants, grant writing techniques grants in technology education, sources of grants in TVET and challenges and prospects in writing grant proposals

(3 units)

VTE 601 Emerging Issues in Technology Education

Identification of emerging issues and challenges that have implications for technology Education – National and Global; Greening TVET concept, green jobs and green skills in technology education, climate change and environmental preservation- implications for technology education, problem solving skills and innovations Today's national and international emphasis on funding and financing of vocational education for increased productivity. Students are expected to deliver one seminar paper in this course.

(3 units)

VTE 606 Career Development in Vocational Education

Planning cooperative education and internship programmes, career planning guide, internship and full time positions, career fairs, professional ethics, writing resumes – functional, chronological, internship, electronic, Power verbs for resume writing, letters and interviews – informational, behavioural, frequently asked questions (FAQs) by employers and employees, transferable skills etc.

(3 units)

VTE 607 Human Resource Management in Vocational Education

Course will focus on identification of available human resources in vocational education; their utilization for efficient vocational programmes implementation and management. Organization of workshops, seminars, conferences on current human resource development issues in vocational education

(3 units)

VTE 608 Public Speaking and Advocacy in Technology

Speaking and listening techniques, speech preparation- organizing and outlining, speech presentation, varieties of public speaking in vocational education, advocacy models, techniques and media, key vocational issues requiring advocacy and public speaking.

(3 units)

VTE 609 Analysis of Apprenticeship systems and Skills Devt.

Apprenticeship concept, types/models in formal and informal TVET systems. Issues and challenges in apprenticeship systems and skills development. Designing apprenticeship programmes in different occupational areas.

(3 units)

ITE 621 Emerging Technologies in Building Construction

Automated Building Diagnostic software (ABDS), Active Window Insulation (AWI), Passive Solar Building Design (PSBD), smart building and workshop, automated machines for building construction and management

(3 units)

ITE 624 Wood Processing/Problem Solving in Building/Wood Technology

Protection of building from elements, Timber products, wood processing equipment and procedures, paper manufacture, Wood Flooring/panelling, wood treatment for various uses in building construction such as flooring, building construction such as flooring, panelling, roof trusees, frames, stairs, hand rails, balusters, other problems and their solutions in building/Wood

(3 units)

ITE 623 Building Regulations and Quality Assurance

Building bye laws, Code of Practice, Building Standards, Regulations relating to Building, Enforcement practices

(3 units)

ITE 626 Advanced Designs in Building Technology

Advanced structural design methods, Engineered wall training, application of wood in the design and construction of buildings, bridges, boats. Focus will be on investigations into ways of developing new/local products, machines and processes in building technology

(3 units)

VTE 675 Modern Communication Systems

Radar, Broadband Communication, fibre optic Technology and Information Theory, coding and Data Communication

(3 units)

VTE 676 Distribution Automation

Introduction – Need Based Energy Management (NBEM) – Advantages of NBEM – conventional Distribution Network – Automated system – sectionalizing switches – Remote terminal units (RTUD) – Data, Acquisition system (DAS) – Communication interface – Distribution SCADA – Man – Machine interface – A Typical SCADA System – Distribution Automation – Load Management in DMS automated distribution system – substation Automation – Requirements – functioning – Feeder Automation – Consumer Side Automation – Energy Auditing – Advantages of Distribution Automation

(3 units)

ITE 633 Emerging Technologies in Electrical/Electronics

Trends and current technologies in electrical/electronics, software applications in Electrical/Electronic, problem solving in electrical/electronic circuits and designs, Dimensions of improvement in Electrical/Electronic technologies, smart electrical/electronic workshops and classrooms.

(3 units)

ITE 636 Consumer Electronic: Problem and Issues

Operation of electrical/electronic appliances and machines; Speed, voltage, current and frequency controls, inverter systems and digital controls problems and issues in electronic control. Candidates will be required to deliver one seminar and a practical project

(3 units)

ITE 680 Electrical/Electronic Instruments and Measurements

Analog and Digital Instruments, other classifications of instruments, the basic meter movement, converting basic meter to DC ammeter, converting basic meter to DC voltmeter, errors in measurement, torques, uses and applications of electronic measuring and testing instruments, cares and maintenance of electrical/electronic testing and measuring instruments,

(3 units)

ITE 641 Production in Mechanical Technology

Prototypes production and testing in metal automobile, design and construction of tools and equipment

(3 units)

ITE 644 Production and Management in Metal/Automobile industries

Metal/automobile industrial processes, industrial production and distribution planning organizing, controlling, directing and co-ordinating industrial processes from design through production to distribution of goods and services

(3 units)

VTE 643 Research Design in Metal/Automobile Technology

Issues, problems and solutions to metal/automobile technology products design. Focus will be on investigation into ways of developing new products, machines processes in metal/automobile technology

(3 units)

ITE 646 Computer Numerical Controlled machines in metal work/Automobile

CNC machine tools- milling, lathe, shaper, drilling etc., the parts of CNC machines tools and their functions, operation of CNC machine tools, project design and production using CNC machines, the use of CNC machines to detect and rectify faults in automobiles

(3 units)

PGC 701 Synopsis and Grant Writing

Identification of types and nature of grant and grant writing; meaning of grants application calls on the internet, determining appropriate strategy for each grant application, study of various grant application structures and contents and writing of concept notes, detailed project description, budgeting and budget defence, study of sample grant writings in various forms and writing of mock research and other grants, Identification of University of Nigeria synopsis structure and requirements, (Introduction, Methodology and Results). Determining the contents of each sub-unit of the synopsis, steps in writing synopsis from the Dissertation/Thesis document, structural and language issues, common errors in synopsis writing and strategies for avoiding them, The roles of the students and the supervisors in the production of a synopsis, and writing of mock synopsis. All registered Ph.D students must attend a solution-based interactive workshop to be organised by the School of Postgraduate Studies for a practical demonstration and application of the knowledge acquired from the course, conducted by selected experts.