GODFREY OKOYE UNIVERSITY
ENUGU, ENUGU STATE, NIGERIA
www.gouni.edu.ng

B.S. ED COMPUTER SCIENCE EDUCATION

The Core Curriculum Minimum Academic Standards (*CCMAS*)

September, 2023.

Overview

The B.Sc. Computer Science Education is a training programme designed to meet the need of the individual, the society and nations of the world. In term of development, the foundation courses in the faculty of education are required to acquaint and further boost as well as to equip students with the pedagogy and skills for productive engagement as they graduate into the world of work. The design is purposeful and mastery is expected to make them relevant to the goal of Nigeria's sustainable national development.

Philosophy

The philosophy of B.Sc. (Ed.) Computer Science Education programme is to train a crop of pre - service teachers who will be competent, skilled and empowered with the highest ethical and professional standards. The products will be skilled in designing, implementing and mentoring competent and knowledgeable computer science students at the secondary school level, and will add value to the community in general.

Objectives

The objectives of the Programme are :

1. equip pre – service specialist teachers and computer education scientists with the skills and competencies required to make them function effectively as graduate teachers in schools and colleges;
2. prepare students for career in academics as educationists' computer science educators (Lecturers and Tutors) and industries;
3. train resource persons in computer education and scientists that are highly motivated and sound in both the theories and practical aspects of the education industry.
4. train graduates that are conversant with the broad- based theories, principles and application of computers;
5. produce resourceful, adaptive and creative scholars to work in secondary schools and colleges of education and who can start personal businesses using the skills and competencies acquired from the course;
6. make graduates of the programme employable researchers in the teaching profession, in the education and computer industry;
7. equip the graduates with skills to engage in career in different fields of human endeavor where ICT tools can be utilized for developmental;
8. equip prospective teachers with proper leadership qualities; and
9. prepare the graduates to fit into the social life of the community and society at

Unique Features of the Programme

Unique features of the programme compared with similar programmes in top universities of the world include:

1. the provision of the requisite flexibility and innovativeness in consistency with institutional autonomy;

2. broadening the learning outcomes and competencies expected of graduates of computer science education programme;
3. combination of science knowledge with the pedagogy in education and computer science.
4. developing appropriate computer science education teaching methods and instructional materials in the disciplines;
5. the syllabus applies scientific methods in gaining technical expertise and computer laboratory skills;
6. development of digital skills that would enable teaching remotely when necessary.
7. developing entrepreneurial skills found necessary for knowledge – based and digital economy; and
8. development of course related entrepreneurial skills that can be gainfully engaging such that the products are equipped to take advantage of employment opportunities.

Employability Skills

The programme will open up exciting and stimulating career opportunities for graduates nationally and internationally. They will be empowered to;

1. develop and effectively run the education sectors because of the practical acquisition of the required digital skill will make them efficient;
2. develop and effectively managed computer education centers;
3. ability to apply ICT skills for propagating business operations;
4. Self - create employment and job opportunities for by running computer centres
5. develop and successfully implement continue education programmes at different
   settings;
6. engage in digital programmes for outreach education programmes and improve communication using computer skills for effective dissemination of literacy messages;
7. become better teachers who would serve in schools, work with Non-Governmental Organizations', (NGOs); Government Agencies, become experts in Computer Science Laboratories; and Professional employers of labour; and
8. their exposure to the foundation courses in education and acquaintance with the pedagogy would lead to purposeful career. Such combination of education with computer science practical knowledge will assist them in a competitive environment since their preparation is favourabe for employment.

21st Century Skills

The programme is designed to bring about the development and acquisition of the under listed 21st Century Skills:

1. problem solving;
2. team work;
3. digital literacy;

4. creativity thinking and information;
5. literacy and critical thinking;
6. decision making; Goal setting;
7. self-management;
8. interpersonal communication;
9. accessing information education pedagogy and computer science skills;
10. analysing influencing behaviours; and
11. advocacy

Admission and Graduation Requirements

Candidates are admitted into the degree programmes in any of the following ways:

4 year Programme

In addition to acceptable passes in UTME, candidates must obtain at credit level passes in the Senior Secondary School Certificate (SSC) in five subjects including English Language, Mathematics, Biology/Health Science/Health or Physical Education or their equivalent in not more than two sittings.

Direct Entry Mode

Five Senior Secondary School Certificate SSC (or its equivalent) credit pass including English Mathematics, Biology/Health or Science/Health or Physical Education or their equivalent and two of which must be at the Advanced Level. Or

1. A pass at merit level in a relevant Diploma Programme (provided the O/L requirements are satisfied).
2. Two passes in relevant subject areas at Advanced level.
3. Passes in two major subjects in relevant areas in the NCE.
4. Two or more advanced papers in GCE or HSC of which one must biology or zoology;
5. Pass in NCE health and physical education or biology/integrated science/food and nutrition from any approved college of education recognized by the university of Nigeria;
6. A pass in two-year diploma in health and physical education of any recognized university with distinction, or credit or merit plus credit level pass in 4 subjects in GCE, WAEC, SSCE, or NECO obtained in not more than two sittings;
7. Technical teacher's certificates in health education obtained from recognized institution; and
8. At least pass in a three-year health education, health technology/nursing/public health nursing diploma programme/community health workers or an equivalent health programme in a recognized university or health institution in addition to minimum of 4 credits in SSCE final examination 'O' level WAEC, GCE or NECO.

9. Diploma in public health nursing, or registered nurse (RN), registered midwife (RM), registered nurse tutor (RNT), community health officers (CHO) certificates obtained from any institution recognized institution.

Graduation Requirements

The following regulations shall govern the conditions for the award of honours degree.

I. Candidates admitted through the UTME mode shall have registered for at least 120 units of courses during the 4-year degree programme.

II. Candidates must have registered and passed all the compulsory courses specified for the programme.

The determination of the class of degree shall be based on the Cumulative Grade Point Average (CGPA) earned at the end of the programme. The CGPA shall be used in the determination of the class of degree.

Course Structure

100-Level

Course Code	Course Title	Unit(s)	Status	LH	PH
GST 111	Communication in English	2	C	15	45
GST 112	Nigerian Peoples and Culture	2	C	30	-
EDU 101	Introduction to Teaching Profession	2	C	30	-
COS 101	Introduction to Computing Sciences	3	C	30	45
COS 102	Problem Solving	3	C	30	45
MTH 101	General Mathematics	2	C	30	-
PHY 102	General Physics	2	C	30	-
PHY 107	General Physics Laboratory	1	C	-	45
GOU-EDU 103	Sociology of Education in South Eastern Nigeria.	2	C	30	0
GOU-CSE 102	Entrepreneurial Computer Education	2	C	30	0
GOU-CSE 103	Special Method of Teaching Computer Operations and applications	2	E	15	45
GOU-CSE 104	Computer Assembly Maintenance and Repair Instruction	2	E	15	45
GOU-CSE 112	Fundamentals of Computer System and Computer Education	2	C	30	0
GOU-CSE 131	Methodological Techniques of Computer Practice	2	C	15	45
	TOTAL	29			

200 Levels

Course Code	Course Title	Units	Status	LH	PH
GST 211	Environment & Sustainable Development	2	C	30	-
ENT 211	Entrepreneurship and Innovation	2	C	30	-
EDU 201	Curriculum, Curriculum Delivery and Teaching Methods	2	C	30	-
COS 201	Computer Programming I	3	C	30	45
COS 202	Computer Programming II	3	C	30	45
CSC 203	Discrete Structures	2	C	30	-
IFT 211	Digital Logic Design	2	C	15	45
IFT 212	Computer Architecture and Organization	2	C	15	45
MTH 201	Mathematical Methods I	2	C	30	-
MTH 202	Mathematical Methods II	2	C	30	-
SEN 201	Introduction to Software Engineering	2	C	30	-
CSC 299	SIWES I	3	C	-	135
GOU-EDU 202	Innovative Approaches to Micro-teaching in Enugu Socio-cultural Milieu	2	C	15	45
GOU-EDU 211	Career Guidance for Learners in Enugu Socio-Cultural Environment.	2	C	30	0
	TOTAL	31			

SIWES I now hold during the long vacation of 200L

300-Level

Course Code	Course Title	Units	Status	LH	PH
ENT 312	Venture Creation	2	C	15	45
GST 312	Peace and Conflict Resolution	2	C	30	-
EDU 301	Teaching Practice I	3	C	-	135
EDU 302	Educational Measurements, Tests, Research Methods and Statistics	2	C	30	-
CSC 301	Data Structures	3	C	30	45
CSC 308	Operating Systems	3	C	30	45

CSC 309	Artificial Intelligence	2	C	30	-
CSC 322	Computer Science Innovation and New Technologies	2	C	15	45
CYB 201	Introduction to Cyber Security and Strategy	2	C	30	-
DTS 304	Data Management	3	C	30	45
ICT 305	Data Communication System & Network	3	C	30	45
CSC 399	SIWES II	3	C	-	135
GOU-EDU 303	Psychology of Education in South East Nigeria	2	C	30	0
GOU-EDU 305	Indigenous Educational Resources for Curriculum Implementation	2	C	30	0
	TOTAL	34			

SIWES now holds during the long vacation of 300L

400-Level

Course Code	**Course Title**	**Units**	**Status**	**LH**	**PH**
EDU 400	Project	3	C	-	135
EDU 401	Teaching Practice II	3	C	-	135
CSC 401	Algorithms and Complexity Analysis	2	C	30	-
INS 401	Project Management	2	C	30	-
CSC 402	Ethics and Legal Issues in Computer Science	2	C	30	-
GOU-EDU 403	Ethno-Pedagogy and Curriculum of Non-School Environment	2	C	30	0
GOU-CSE 403	Wireless Communication and Mobile Computing Technology in Education	2	C	15	45
GOU-CCE 411	Teaching the Development of Mobile Applications	2	C	30	0
GOU- CSE 414	Data Mining and Security Issues in Education	2	E	15	45
GOU-CSE 415	Pedagogical Approach in Computer Graphics	2	**E**	15	45
GOU-CSE 421	Pedagogical Approach in Teaching and Learning of Computer Networking	2	C	30	0

GOU- CSE 422	Hardware Security and Digital Forensics Methodologies.	2	C	30	0
GOU- CSE 441	Instructional Software Development and its Methodologies in Education	2	C	15	45
	TOTAL	28			

Course Contents and Learning Outcomes

GST 111: Communication I English (2 Units C: LH15; PH45)

Leaning Outcomes

At the end of this course, students should be able to:

1. identify possible sound patterns in English Language;
2. list notable Language skills;
3. classify word formation processes;
4. construct simple and fairly complex sentences in English;
5. apply logical and critical reasoning skills for meaningful presentations;
6. demonstrate an appreciable level of the art of public speaking and listening;
7. write simple and technical reports;
8. learn the major word formation process; 9. apply ICT in to modern language learning, and
10. practice report writing.

Course Contents

Sound patterns in English Language (vowels and consonants, phonetics and phonology). English word classes (lexical and grammatical words, definitions, forms, functions, usages, collocations). Sentence in English (types: structural and functional, simple and complex). Grammar and Usage (tense, mood, modality and concord, aspects of language use in everyday life). Logical and Critical Thinking and Reasoning Methods (Logic and Syllogism, Inductive and Deductive Argument and Reasoning Methods, Analogy, Generalisation and Explanations). Ethical considerations, Copyright Rules and Infringements. Writing Activities: (Pre-writing, Writing, Post writing, Editing and Proofreading; Brainstorming, outlining, Paragraphing, Types of writing, Summary, Essays, Letter, Curriculum Vitae, Report writing and Note making. Mechanics of writing). Comprehension Strategies: (Reading and types of Reading, Comprehension Skills, 3RsQ). Information and Communication Technology in modern Language Learning. Language skills for effective communication. Major word formation processes. Writing and reading comprehension strategies. Logical and critical reasoning for meaningful presentations. Art of public speaking and listening. Report writing.

GST112: Nigerian Peoples and Culture (2 Units C: LH 30)

Leaning Outcomes

At the end of the course, students should be able to:

1. analyse the historical foundation of the Nigerian culture and arts in pre-colonial times;
2. list and identify the major linguistic groups in Nigeria;
3. explain the gradual evolution of Nigeria as a political unit;
4. analyse the concepts of Trade, Economic and Self-reliance status of the Nigerian peoples towards national development;
5. enumerate the challenges of the Nigerian State towards Nation building
6. analyse the role of the Judiciary in upholding people's fundamental rights
7. identify acceptable norms and values of the major ethnic groups in Nigeria;
8. list and suggest possible solutions to identifiable Nigerian environmental, moral and value problems;
9. demonstrate knowledge of the concepts of trade and economics of self-reliance, and
10. identify with the current socio-political and cultural developments in Nigeria.

Course Contents

Nigerian history, culture and art up to 1800 (Yoruba, Hausa and Igbo peoples and culture; peoples and culture of the ethnic minority groups). Nigeria under colonial rule (advent of colonial rule in Nigeria; Colonial administration of Nigeria). Evolution of Nigeria as a political unit (amalgamation of Nigeria in 1914; formation of political parties in Nigeria; Nationalist movement and struggle for independence). Nigeria and challenges of nation building (military intervention in Nigerian politics; Nigerian Civil War). Concept of trade and economics of selfreliance (indigenous trade and market system; indigenous apprenticeship system among Nigeria people; trade, skill acquisition and self-reliance). Social justices and national development (law definition and classification. Judiciary and fundamental rights. Individual, norms and values (basic Nigeria norms and values, patterns of citizenship acquisition; citizenship and civic responsibilities; indigenous languages, usage and development; negative attitudes and conducts. Cultism, kidnapping and other related social vices). Re-orientation, moral and national values (The 3R's – Reconstruction, Rehabilitation and Re-orientation; Reorientation Strategies: Operation Feed the Nation (OFN), Green Revolution, Austerity Measures, War Against Indiscipline (WAI), War Against Indiscipline and Corruption (WAIC), Mass Mobilization for Self-Reliance, Social Justice and Economic Recovery (MAMSER), National Orientation Agency (NOA). Current socio-political and cultural developments in Nigeria.

EDU 101: Introduction to Teaching and Foundations of Education
(2 Units C: LH 30)

Learning Outcomes

At the end of the course, the students should be able to:

1. state the important roles of teaching as a profession;
2. raise and judge some ethical issues in education;
3. list the intellectual and practical competencies required by the teacher;
4. justify the need for education in the development of a nation;
5. give an account of the history of education from ancient times to the present day modern education in Nigeria;
6. present an overview of the National Policy on Education;
7. identify the stages of child and adolescent development;
8. state the behaviourist, cognitive and socio-cultural perspectives of learning;
9. enumerate historical and current developments in sociology of education, and
10. highlight the historical and current developments in philosophy of education.

Course Contents

Teaching as a profession. Ethics of the teaching profession. Intellectual and practical competencies required by the teacher. Link between education and development. Educational development from ancient times to the present with particular reference to the evolution of modern education in Nigeria. The National Policy on Education. Brief treatment of learning theories from the behaviourist, cognitive and socio cultural perspectives. Child and adolescent development. Historical and current developments in philosophy of education. Historical and current developments in sociology of education

COS 101: Introduction to Computing Sciences (3 Units C: LH 30; PH 45)

Learning Outcomes

1. trace historical development of computing to the current programmes in the discipline;
2. distinguish the salient characteristics of the different programmes of the computing discipline;
3. identify the roles and applications of computers and computing in different areas of human endeavour;
4. identify and explain the basic components of a computer system;
5. develop basic literacy on the use of computer systems;
6. develop competence on the use of common Office productivity applications; and
7. make purposeful use of the Internet for information gathering, learning and continuous professional development.

Course Contents

History of computing sciences leading to the different programmes in the discipline. Characteristics of each programme in computing sciences. Hardware, Software; and human resources; Integration and application in business and other segments of society. Information processing and its roles in society; Students will be required to complete lab assignments using the PC's operating system, and several commonly used applications, such as word processors, spreadsheets, presentations, graphics and other applications. Internet and on-line resources, browsers, and search engines.
Prerequisite: None

COS 102: Problem Solving (3 Units C: LH 30, PH 45)

Learning Outcomes

At the end of this course, students should be able to

1. explain concepts related to problem solving and identify problem types;
2. identify and explain problem solving methods;
3. exemplify solvable and unsolvable problems;
4. interpret given problems and formulate solutions to them using flowchart, pseudocode and/or other formalisms;
5. apply appropriate strategies and procedures to arrive at workable solutions to problems; and
6. develop critical thinking and problem solving skills required throughout the computing career.

Course Contents

Introduction to the core concepts of computing, problems, and problem-solving. The identification of problems and types of problems (routine problems and non-routine problems). Method of solving computing problems (Introduction to Algorithms and heuristics).
Solvable and unsolvable problems. Solution techniques of solving problems (abstraction, analogy, brainstorming, trial and error, hypothesis testing, reduction, literal thinking, meansend analysis, method of focal object, morphological analysis, research, root cause analysis, proof, divide and conquer). General Problem-solving process. Solution formulation and design: flowchart, pseudocode, decision table, decision tree. Implementation, evaluation and refinement.

MTH 101: Elementary Mathematics I (Algebra and Trigonometry) (2 Units C: LH 30)

Learning Outcomes

At the end of the course students should be able to

1. state basic definition of Set, Subset, Union, Intersection, Complements and use of Venn diagrams;
2. solve quadratic equations;
3. solve trigonometric functions;

4. use various types of numbers; and
5. solve some problems using Binomial theorem.

Course Contents

Elementary set theory, subsets, union, intersection, complements, venn diagrams. Real numbers; integers, rational and irrational numbers, mathematical induction, real sequences and series, theory of quadratic equations, binomial theorem. Complex numbers; algebra of complex numbers; the Argand diagram. De-Moivre's theorem, nth roots of unity. Circular measure, trigonometric functions of angles of any magnitude, addition and factor formulae.

PHY 102: General Physics II (Behaviour of Matter) (2 Units C: LH 30)

Learning Outcomes

At the end of the course students should be able to

1. explain the concepts of heat and temperature and relate the temperature scales;
2. define, derive, and apply the fundamental thermodynamic relations to thermal systems;
3. describe and explain the first and second laws of thermodynamics, and the concept of entropy;
4. state the assumptions of the kinetic theory and apply techniques of describing macroscopic behaviour;
5. deduce the formalism of thermodynamics and apply it to simple systems in thermal equilibrium; and
6. describe and determine the effect of forces and deformation of materials and surfaces.

Course Contents

Heat and Temperature. Temperature scales. Gas laws. General gas equation. Thermal conductivity. First Law of thermodynamics. Heat, work and internal energy, reversibility. Thermodynamic processes. Adiabatic, isothermal, isobaric. Second law of thermodynamics. heat engines and entropy, Zero's law of thermodynamics. Kinetic theory of gases. Molecular collisions and mean free path. Elasticity. Hooke's law, Young's, shear and bulk moduli. Hydrostatics. Pressure, buoyancy, Archimedes' principles. Bernoulli's equation and incompressible fluid flow. Surface tension. Adhesion, cohesion, viscosity, capillarity, drops and bubbles.

PHY 107: General Practical Physics I (1 Unit C: PH 45)

Learning Outcomes

At the end of the course students should be able to:

1. conduct measurements of some physical quantities;
2. make observations of events, collect and tabulate data;
3. identify and evaluate some common experimental errors;

4. plot and analyse graphs; and
5. draw conclusions from numerical and graphical analysis of data.

Course Contents

This introductory course emphasizes quantitative measurements, the treatment of measurement errors, and graphical analysis. A variety of experimental techniques should be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems, light, heat, viscosity and others, covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

GOU-EDU 103: Sociology of Education in South East Nigeria (2 Units; Compulsory; LH = 30; PH = 0)

Senate-Approved-Relevance

The training of prospective teachers in Sociology of Education in a way that they will acquire the knowledge and skills that would enable them operate most effectively in the Enugu Nigerian cultural environment is a need. The course underscores the importance of determining how public and social institutions and the experience of people in South Eastern Nigeria affect education and its outcomes. This is in line with the mission and vision of Godfrey Okoye University Enugu that focuses on quality training of students in learning and character in order to be productive to their immediate environment. Therefore, graduates of this course will play a crucial role in helping the locals to achieve their economic, health, and political wellbeing.

Overview

This course applies the philosophy and theories of sociology of education to the study of how social and cultural institutions affect education in South Eastern Nigeria. This course on the Sociology of Education will help the students acquire knowledge and skills that will help them to tap the potentials of their natural/cultural environment for the benefit of education.

Furthermore, this course is designed to expose learners to some contemporary sociological thoughts and skills for dealing innovatively with situations in the area of their discipline of study. It is also designed to prepare prospective teachers for their future career in human and societal development. Most importantly, it is designed to instil in the student teachers the desired skills in human relationships.

Objectives

The objectives of this course are to:

1. Explain the concept of Sociology of Education.
2. Expose the philosophical root of sociology of education.
3. Discuss theories of Sociology of Education.
4. Expose the functions of Sociology of Education.
5. Discuss pertinent sociological topics in South-Eastern socio-cultural environment.
6. Evaluate the teaching of societal values in schools.
7. Discuss how South Eastern social institutions affect education and its outcome.
8. Examine the ways education can encourage social integration and cultural innovation.

Learning Outcomes

By the end of this course, the student should be able to:

1. Define Sociology of Education
2. Discuss the ideas of the Founders of Sociology of Education.
3. Discuss two theories of sociology of Education.
4. Explain the importance of Sociology of Education.
5. Discuss three functions of Sociology of Education.
6. Analyse the concept of Sociology of Education in relation to three social institutions in the South East.
7. Explain the importance of teaching societal values in schools.
8. Discuss five ways in which a selected social institution affect education in the South East.

Course Content

Concept of Contemporary Sociology of Education. Philosophical roots of Sociology of Education. The Founders of Sociology of Education. Theories of sociology of education. Importance of Sociology of Education. Functions of Sociology of Education. The Socio-Cultural environment in the South East. Social Institutions in South Eastern Nigeria. The Public School System. Adult and Continuing Education. The Igbo Apprenticeship system. Training in Special Education. Training in Geriatric and Child care. Gender Relations. Race and Ethnicity. Rural and Urban Residence in South-Eastern Nigeria. Teaching societal values in schools. Effect of social institutions on education.

Minimum Academic Standards

1. 3-D Technology.
2. Computers (1:3 students).
3. Other NUC-MAS requirement facilities.

GOU-SCE 102: Entrepreneurial Computer Education (2 Units; Compulsory; LH = 30; PH= 0)

Senate Approved Relevance

Considering the high level of unemployment in Nigeria, any institution that means well for the students must champion entrepreneurship at its peak. Entrepreneurial Computer Education will equip the graduate computer educators with the necessary skills to give back to the society by becoming entrepreneurs who are employers of labor and consultants in Enugu State where the opportunity is availed. This goal aligns with the mission of Godfrey Okoye University to produce outstanding graduate teachers of strong personalities who will contribute to the betterment of the society, and in line with Agenda 2063 Goal 1, of achieving a high standard of living, quality of life and well-being for all citizens.

Overview

Many developed countries like Germany which is the most populous country in the European Union and the largest economy in Europe has long ago solidified its economy through entrepreneurship. Therefore, to eradicate unemployment in our country Nigeria and particularly Enugu State, future graduates must be provided with entrepreneurial skills of opening and managing their own private businesses.

This course will equip computer science education students with the ideas in business structures, use of computer in entrepreneurship field and skills to sustain established enterprise. Also, it will give them more insight and relevant information through Information Technology.

Objectives

The objectives of this course are to:

1. Describe the concept of entrepreneurship.
2. Discuss characteristics of a good entrepreneur.
3. Identify needs/importance of entrepreneurship in Nigerian society.
4. Identify the roles of a computer educator who is an entrepreneur.
5. Draw out the impact of computer education to entrepreneurship.
6. Describe online entrepreneurship.
7. Identify digital skills for online entrepreneurship.
8. Discuss the roles of entrepreneurs in Nigerian society.
9. Explain computer education business organization and financing.

Learning Outcomes

By the end of this course, the students should be able to:

1. Explain the concept of entrepreneurship.
2. Discuss five characteristics of a good entrepreneur.
3. Identify needs/importance of entrepreneurship Nigerian society.
4. Describe at least five roles of a computer educator who is an entrepreneur.
5. Draw out the impact of computer education to entrepreneurship.
6. Describe online entrepreneurship.
7. Identify seven digital skills for online entrepreneurship.
8. Discuss five roles of entrepreneurs in Nigerian society.
9. Explain computer education business organization and financing.

Course Content

Entrepreneurship. Types of entrepreneurship. Entrepreneurship and Computer Science Education. Entrepreneur and entrepreneurial skill. Characteristics of an entrepreneur. Roles of

entrepreneurship. Importance of entrepreneurship education. Merits and demerits of entrepreneurship. Online entrepreneurship. Computer educator entrepreneur. Digital skills in online entrepreneurship. Computer science education entrepreneurship models. Entrepreneurs in Computer Education. Business organization and financing. Business enterprises. Co-operative association. Public and joint enterprises. Different entrepreneurs in Nigeria.

Minimum Academic Standard

Samples of Business Enterprise Certificates.
Computer system.
Other NUC-MAS requirement facilities.

GOU-CSE 103: Special Method of Teaching Computer Operations and Applications (2 Units; Elective; LH =15; PH= 45)

Senate- Approved Relevance

The need to train students in computer operations and application cannot be overemphasized owing to the geometric transition of businesses and internet driven economy of firms and industries in Enugu State. There is no doubt that the analog age of business is gradually going into extinction as business and firms seem to be maximizing higher profit at minimal cost with the instrumentality of computer. Enugu State is highly populated and rich in different entrepreneurial ventures capable of absorbing graduates that are knowledgeable in computer skills to boost the quality of education in schools. This is in line with the mission of Godfrey Okoye University to produce entrepreneurial equipped graduates that are employable in the locality and beyond as well as in agreement with SDG Agenda of year 2063 for producing a well-educated citizens and skills revolution underpinned by science, technology and innovation. Therefore, a course on computer operations and applications has been carefully designed to train students with the needed skills to excel in their different endeavor upon graduation.

Overview

Every organization in this digital age will expect from their employee's basic computer skills which cover computer operation and application. These skills include inputting, outputting, storing, and controlling data. It is the ability to properly manipulate the basic skills that guarantee effective data organization, calculation and evaluation of quantitative data of the organization without which the business might no longer stand the taste of time.

This course has been carefully designed to sharpen student's ability to use basic programmes like spreadsheet and its feature and other programmes in Microsoft Office to enhance their analytical skills and better data management for decision making. The course shall ensure that students gain needed and adequate training to excel in the 21st century computer driven economy to ensure higher employability demands.

Objectives

The objectives of the course are to:

1. Describe the processes of data input in the computer.
2. Describe the procedures of storing data in the computer.
3. Explain the steps for organizing data for easy navigation.
4. Discuss the strategies of representing data in graphics and charts.

5. Describe mathematical and logical functions.
6. Discuss the methods of data analysis for prediction.
7. Explain the interpretation of result of data analysis and decision making.
8. Describe the factors to be considered before selecting application for computer operations.
9. Explain methods of data transfer from one device to another using the wired and wireless system.
10. Describe the modalities of converting soft copy data into hard copy.
11. Convert a document in soft copy into hard copy.

Learning Outcomes

On completion of the course, the student should be able to:

1. Enumerate at least two methods of inputting data into the computer.
2. Explain at least five steps of storing data in the computer system.
3. Describe at least three methods of data organization to ease navigation.
4. List at least two strategies of representing data in graphics and charts.
5. Describe at least five mathematical and logical functions.
6. Explain at least five methods of data analysis.
7. Enumerate at least four possible decision that can be taken during data analysis.
8. Describe at least six factors to be considered before selecting application for computer operation.
9. Outline five differences between wired and wireless transfer of data among devices.
10. Explain at least three steps of converting soft copy document to hard copy.

Course Content

Meaning of data and input devices. Creating folders for data storage. Location for data storage. Security and password of stored data. Data organization and arrangement. Data transfer between different domains. Representing data in graphics. Representing data on charts. Mathematical and logical functions. Types of data analysis. Designs for data analysis. Decision rules in data analysis. Computer application for operations. Features of Microsoft office programmes. Wired and wireless data transfer. Forms of data (soft and hard copy). Conversion from soft to hard copy and from hard to soft copy.

Minimum Academic Standards

Functional computer system. Computer Science Laboratory. Whiteboard. Projector. Other NUC –MAS requirement facilities.

GOU-CSE 104: Computer Assembly Maintenance and Repair Instruction (2 Units; Elective; LH =15; PH= 45)

Senate- Approved Relevance

Computer assembly, maintenance, and repair is an essential course needed by prospective computer science teachers, who should have basic knowledge of the repair and maintenance of a computer system. Because computer repair can be so complicated, it is imperative that computer science students understand the technicalities before graduation. The advantages of this course are numerous. The course will bring out the potential competence in the learner as the learner practices that which is learned and not just a paper graduate. The course is highly entrepreneurial as the student will be hired and paid for maintenance and repairs. This is in line with the mission of Godfrey Okoye University to produce graduates that are equipped and

employable in their various fields of endeavor upon graduation. There is no doubt that upon completion of this course, the students will solve many problems of computer systems through repairs of the damaged ones and maintenance of the working one to avert future damage to the computer system. Also, this is in congruence with Agenda 2063 Goal 2 of achieving Education and science, technology and innovation (STI) driven skills revolution.

Overview

This course has been developed to equip the students with simple technicalities needed by a computer student to handle computer related problems ranging from simple software maintenance and upgrade, repairs of damaged computer, troubleshooting, simple assembling of computer and setting them up for operation. Upon completion of this course, it is expected that the students have not just graduated loaded with grammar and theory without practical skills but a graduate with the technological know-how whose potential can be fully employed. By the end of this course the students would have gained a sound understanding of all the basics of PC repairs that will make them fulfilled in their chosen career and good entrepreneurial. Graduates of this course can look forward to plenty of rewarding opportunities as self-employed PC repair technicians. The course shall ensure that students gain needed and adequate training to excel in the 21st century computer driven economy to ensure higher employability demands.

Objectives

The objectives of the course are to:

1. Describe the processes of repairing computer hardware.
2. Describe the procedures involved in software installation computer.
3. Explain the rules of computer maintenance.
4. Discuss the approaches to computer services and maintenance.
5. Describe the importance of troubleshooting.
6. Explain the emerging trends like SATA express, USB and thunderbolt.
7. Describe the newest computer processors and their operationalities.
8. Explain software installation.
9. Describe the modalities of system upgrades.

Learning Outcomes

On completion of the course, the student should be able to:

1. Enumerate at least three processes of repairing computer hardware.
2. Explain at least five procedures of software installation.
3. Describe at least three rules guiding computer maintenance.
4. List at least two ways of maintaining the computer system to avoid damages.
5. Describe at least five importance of troubleshooting.
6. Explain at least five advantages of compatible touch screen.
7. Enumerate at least two emerging trends that have helped in keeping the computer in operations
8. Describe at least six operations of the newest processor that differentiate it from others.
9. Outline two ways software can be installed in the computer.
10. Explain at least two ways of upgrading the computer system.

Course Content

Building PCs from total scratch and from choosing and assembling the hardware. BIOS setup. Software installation. Troubleshooting. HDMI, and DisplayPort connections. Windows 8 compatible multi-touch touchscreen technology. PCI Express 3.0, 4.0 interfaces. Power Supply

specifications. New firmware innovations. 3TB (and larger) disks, 4K sectoring. Partition alignment. Faster SATA disk interfaces, and SSD (solid state drive). Hard drive replacements. Emerging interfaces such as SATA Express, USB 3.0, and Thunderbolt. The newest processors, including Intels 3rd generation Ivy Bridge Core i-Series processors and AMDs 2nd generation Trinity CPUs and software issues. Software installation. Computer antivirus. Computer upgrading.

Minimum Academic Standards

Damaged computer systems, functional computer systems. Laboratories. Whiteboard. Projector. Other NUC –MAS requirement facilities.

GOU-CSE 112: Fundamentals of Computer System and Computer Education (2 Units; Compulsory; L = 30; P = 0)

Senate-Approved Relevance
Computer Science Education, as a programme that anchors on the training of sure-footed teachers who in their knowledge and competence of computer have the ability to inculcate in their future students the holistic knowledge of computer, cannot be fully undertaken without the knowledge of its basics. This course intends to expose the students to the rudiments of computer, background knowledge of computer system and need for computer education. It will as well equip them with necessary skills that will enable them to be good teachers and disseminators of knowledge which is in line with the philosophy of Godfrey Okoye University especially in Enugu State that is densely populated with educational institutions and organizations. This is also in line with the United Nation's Sustainable Development Goals 2 on producing well educated citizens and skills revolution underpinned by Science, Technology and Innovation.

Overview
Effective teaching of computer Science Education in secondary schools requires competent teachers who can effectively pass across the knowledge of computer to the younger generation. Following that Computer Education is relatively new in Nigeria education curriculum, many schools (primary, secondary and tertiary) both private and government owned in Enugu State are with open arms to welcome competent computer educators who would help them to meet up with the huge demand for computer knowledge posed by the digital world in this 21st century.

This course is designed to expose the computer education students with the basic knowledge of computer, the relevance of computer education and equip them with the necessary skills needed to operate computer system. Also, the course will enable the students who are prospective teachers to acquire essential knowledge of computer system in order to inculcate it in their future students.

Objectives
The objectives of this course are to:

1. Explain the concept of computer system.
2. Discuss the historical generation of computer.
3. Identify the major parts of computer system.
4. List and explain types of computer.
5. Discuss the concept of computer education.
6. Discuss the need for computer education in the 21st century.
7. Apply computer in carrying out different educational tasks.
8. Analyze the process of integration of computer education into Nigeria Education Curriculum.
9. Identify different Agencies involved in the propagation of computer education in Nigeria.

Learning Outcome
By the end of this course, the students should be able to:

1. Discuss the concept of computer system.
2. Trace the historical generation of computer.
3. Identify the major parts of computer system.
4. List and explain types of computer.
5. Discuss the concept of computer education.
6. Identify the need for computer education in 21st century Nigeria.
7. Apply computer in carrying out at least three different educational tasks.
8. Analyze the process of integration of computer education into Nigeria Education Curriculum.
9. Identify two different Agencies involved in the propagation of computer education in Nigeria.

Course Content

Meaning of computer. History of computer. Generation of computer. Types of Computer. Computer system. Functionalities of computer system. Parts of computer system. Computer tasks. Computer virus. Theories of computation. Configuration methods of computer. Software and hardware. Places where computers are used. Concept of computer education. Need of computer education in Nigeria. Integration of computer education into Nigeria Education Curriculum. Problems of computer evolution. Agencies involved in the propagation of computer education in Nigeria.

Minimum Academic Standard

- Computer Lab.
- Personal computer

GOU-SCE 131: Methodological Techniques of Computer Practice (2 Units; Compulsory; LH =15; PH = 45)

Senate Approved Relevance

This course intends to train graduates who will be highly skilled and knowledgeable in handling computer and using it to meet the demands of general masses of Enugu State as regarding the practical use of computer to achieve organizational goals and other operations such as information gathering, information storage, information retrieval, manipulation of document, filing etc. This is in consonant with the vision of Godfrey Okoye University, as a center of excellence and hallmark of acquisition of balanced learning, to imbibe in its graduates the necessary computer skills to be relevant and absorbed in areas like educational institutions, private firms, co-operatives associations, business enterprises among others. Also, this is in agreement with the Agenda 2063 Priority Area 2 to achieve Education and Science, Technology and Innovation (STI) driven skills revolution.

Overview

Manual handling of information and running of organizational affairs exposes organizations to different threats and errors. Many organizations, due to lack of experts and computer literate staff, still face the dilemma of losing important documents to virus and other manual mismanagements. In some offices, computer systems are provided but are lying waste and are

used as decorators because they lack the technical knowhow and skills required in operating those computer systems.

This course showcases the usage of computer and procedures involved in carrying out information processing tasks, software installation etc. Hence, this course is designed to adequately equip students to fill the existing gaps in various business enterprises and institutions.

Objectives

The objectives of this course are to:

1. Explain computer booting.
2. Analyze booting procedures.
3. Outline and describe types of booting.
4. Discuss computer viruses.
5. State causes of computer virus.
6. Identify preventive measures and recommended treatments of computer viruses.
7. Install computer antivirus.
8. Discuss electronic file processing method.
9. Apply some application packages such Microsoft Word Processing, Microsoft Excel etc.

Learning Outcomes

By the end of this course, the students should be able to:

1. Explain computer booting.
2. Analyze booting procedures.
3. Outline and describe two types of booting.
4. Discuss at least three computer viruses.
5. State five causes of computer virus.
6. Identify preventive measures and recommended treatments of computer viruses.
7. Install computer antivirus.
8. Discuss electronic file processing method.
9. Apply some application packages such as Microsoft Word Processing, Microsoft Excel etc.

Course Content

Interaction of the user with the operating system. Operating system. Application areas of computer. Booting. Booting procedures. Types of booting in a microcomputer environment. Computer viruses. Causes of computer virus. Types of computer virus. Preventive measures and recommended treatments of computer virus. Exposure to hardware components. Storage devices. Antivirus types and installation. Electronic Word processing. Advantage of electronic word processing over manual processing. Installation of application software packages. Running of application packages. Application of Microsoft Word. Electronic Spreadsheet.

Minimum Academic Standard

Computer Laboratory

Computer (Laptop)

Raw application software

GST 212: Philosophy, Logic And Human Existence (2 Units C: LH 30)

Learning Outcomes

A student who has successfully gone through this course should be able to:

1. explain the basic features of philosophy as an academic discipline;
2. identify the main branches of philosophy & the centrality of logic in philosophical discourse;
3. explain the elementary rules of reasoning;
4. distinguish between valid and invalid arguments;
5. think critically and assess arguments in texts, conversations and day-to-day discussions;
6. critically asses the rationality or otherwise of human conduct under different existential conditions;
7. develop the capacity to extrapolate and deploy expertise in logic to other areas of knowledge; and
8. guide his or her actions, using the knowledge and expertise acquired in philosophy and logic.

Course Contents

Scope of philosophy; notions, meanings, branches and problems of philosophy. Logic as an indispensable tool of philosophy. Elements of syllogism, symbolic logic— the first nine rules of inference. Informal fallacies, laws of thought, nature of arguments. Valid and invalid arguments, logic of form and logic of content — deduction, induction and inferences. Creative and critical thinking. Impact of philosophy on human existence. Philosophy and politics, philosophy and human conduct, philosophy and religion, philosophy and human values, philosophy and character molding.

ENT211: Entrepreneurship and Innovation (2 Units C: LH15; PH45)

Leaning Outcomes

At the end of this course, students should be able to:

1. explain the concepts and theories of entrepreneurship, entrepreneurships opportunity seeking, new value creation, and risk taking;
2. state the characteristics of an entrepreneur;
3. analyse the importance of micro and small businesses in wealth creation, employment, and financial independence;
4. engage in entrepreneurial thinking;
5. identify key elements in innovation;
6. describe stages in enterprise formation, partnership and networking including business planning;
7. describe contemporary entrepreneurial issues in Nigeria, Africa and the rest of the world;
8. state the basic principles of e-commerce;

9. demonstrate ability to perform reflective and creative thinking; and 10. apply the basics of a business plan.

Course Contents

Concept of Entrepreneurship (Entrepreneurship, Entrepreneurships / Corporate Entrepreneurship,). Theories, Rationale and relevance of Entrepreneurship (Schumpeterian and other perspectives, Risk-Taking, Necessity and opportunity-based entrepreneurship and Creative destruction). Characteristics of Entrepreneurs (Opportunity seeker, Risk taker, Natural and Nurtured, Problem solver and change agent, Innovator and creative thinker). Entrepreneurial thinking (Critical thinking, Reflective thinking, and Creative thinking). Innovation (Concept of innovation, Dimensions of innovation, Change and innovation, Knowledge and innovation). Enterprise formation, partnership and networking (Basics of Business Plan, Forms of business ownership, Business registration and Forming alliances and join ventures). Contemporary Entrepreneurship Issues (Knowledge, Skills and Technology, Intellectual property, Virtual office, Networking). Entrepreneurship in Nigeria (Biography of inspirational Entrepreneurs, Youth and women entrepreneurship, Entrepreneurship support institutions, Youth enterprise networks and Environmental and cultural barriers to entrepreneurship). Basic principles of e-commerce.

EDU 201: Curriculum, Curriculum Delivery and Teaching Methods
(2 Units C: LH30)

Learning Outcomes

At the end of the course, the students should be able to:

1. explain at an appropriate level of confidence the meaning and types of curriculum;
2. describe the process of curriculum development; analyse and critique the Nigerian Core curricula as guide to curricula delivery;
3. use different methods in the delivery of curriculum content;
4. identify local epistemologies and context and the use of CTCA in the Nigerian context;
5. plan and schedule lessons as well as monitor and evaluate the outcome of each lesson; 6. identify and use learning resources and media and improvise, when necessary;
7. manage classrooms under different conditions and address the needs of individual students, especially, those with special needs including the gifted;
8. demonstrate skills in ICT, set up and manage online classes; 9. demonstrate the application of general classroom management; and
10. skilfully attend to students with special needs.

Course Contents

Definition and types of curriculum. The curriculum development process. The Nigerian core curricula. Curriculum delivery to include general teaching methods and strategies: lecture, class discussion, demonstration, problem-solving, cooperative learning and guided-discovery, concept mapping, metacognition, argumentation, project-based learning, competency-based learning, culturo-techno-contextual approach (CTCA). Developing the lesson plan/note. Assessment of learning. Resources for teaching and improvisation. General classroom management. Teaching in a 21st century classroom. Setting up and managing online classes. Attending to students with special needs.

COS 201: Computer Programming I (3 Units C: LH 30, PH 45)

Learning Outcomes

At the end of this course, students should be able to

1. identify different programming paradigms and their approach to programming;
2. write programs using basic data types and strings;
3. design and implement programming problems using selection;
4. design and implement programming problems using loops;
5. use and implement classes as data abstractions in an object-oriented approach;
6. implement simple exception handling in programs;
7. develop programs with input/output from text files; and
8. design and implement programming problems involving arrays.

Course Contents

Introduction to computer programming. Functional programming; Declarative programming; Logic programming; Scripting languages. Introduction to object-orientation as a technique for modeling computation. Introduction of a typical object-oriented language, such as Java; Basic data types, variables, expressions, assignment statements and operators; Basic objectoriented concepts: abstraction; objects; classes; methods; parameter passing; encapsulation. Introduction to Strings and string processing; Simple I/O; control structures; Arrays; Simple recursive algorithms; inheritance; polymorphism

Lab work: Programming assignments involving hands-on practice in the design and implementation of simple algorithms such as finding the average, standard deviation, searching and sorting. Practice in developing and tracing simple recursive algorithms.

Developing programs involving inheritance and polymorphism.

Prerequisite: COS 102 Problem Solving

CSC 203: Discrete Structures (2 Units C: LH 30)

Learning Outcomes

At the end of this course, the students will be able to

1. convert logical statements from informal language to propositional and predicate logic expressions.
2. describe the strengths and limitations of propositional and predicate logic.
3. outline the basic structure of each proof technique (direct proof, proof by contradiction, and induction) described in this unit.
4. apply each of the proof techniques (direct proof, proof by contradiction, and induction) correctly in the construction of a sound argument.
5. apply the pigeonhole principle in the context of a formal proof.
6. compute permutations and combinations of a set, and interpret the meaning in the context of the particular application.
7. map real-world applications to appropriate counting formalisms, such as determining the number of ways to arrange people around a table, subject to constraints on the seating arrangement, or the number of ways to determine certain hands in cards (such as, a full house).
8. solve a variety of basic recurrence relations.

Course Contents

Propositional Logic. Predicate Logic. Sets. Functions. Sequences and Summation. Proof Techniques. Mathematical induction. Inclusion-exclusion and Pigeonhole principles.

Permutations and Combinations (with and without repetitions). The Binomial Theorem. Discrete Probability. Recurrence Relations.

IFT 211: Digital Logic Design (2 Units C: LH 15: PH 45)

Learning Outcomes

At the end of this course, students will be able to:

1. explain why everything is data, including instructions, in computers;
2. describe how negative integers, fixed-length numbers, and non-numeric data are represented;
3. convert numerical data from one format to another;
4. describe computations as a system characterized by a known set of configurations with transitions from one unique configuration (state) to another (state);
5. describe the distinction between systems whose output is only a function of their input
   (Combinational) and those with memory/history (Sequential);
6. describe a computer as a state machine that interprets machine instructions;
7. articulate that there are many equivalent representations of computer functionality, including logical expressions and gates, and be able to use mathematical expressions to describe the functions of simple combinational and sequential circuits; and

8. design the basic building blocks of a computer: arithmetic-logic unit (gate-level), registers (gate-level), central processing unit (register transfer-level), and memory (register transfer-level).

Course Contents

Fundamental constructs and concepts underlying computer hardware and software which includes:
Number systems, binary arithmetic, codes, gates, Boolean expressions. Boolean algebra. Manipulation and minimization of completely and incompletely specified Boolean functions. Boolean switching function synthesis. Iterative arrays, sequential machines. Physical properties of gates: fan-in, fan-out, propagation delay. Timing diagrams and tri-state drivers. Combinational circuits design using multiplexers, decoders, comparators, and adders. Sequential circuit analysis and design, basic flip-flops, clocking, and timing diagrams. Registers, counters, RAMs, ROMs, PLAs, PLDs, and FPGA.s.

IFT 212: Computer Architecture and Organization (2 Units C: LH 15, PH 45)

Learning Outcomes

At the end of this course, students should be able to

1. explain different instruction formats, such as addresses per instruction and variable length vs. fixed length formats;
2. explain the organization of the classical von Neumann machine and its major functional units;
3. explain how subroutine calls are handled at the assembly level;
4. explain the basic concepts of interrupts and I/O operations;
5. write simple assembly language program segments;
6. show how fundamental high-level programming constructs are implemented at the machine-language level;
7. compare alternative implementation of datapaths;
8. discuss the concept of control points and the generation of control signals using hardwired or microprogrammed implementations;
9. describe how the use of memory hierarchy (cache, virtual memory) is used to reduce the effective memory latency; and
10. explain how interrupts are used to implement I/O control and data transfers.

Course Contents

Instruction format and types, memory and I/O instructions, dataflow, arithmetic, and flow control instructions, addressing modes, stack operations, and interrupts. Datapath and control unit design. RTL, microprogramming, and hardwired control. Practice of assembly language programming. Memory hierarchy, cache memory, virtual memory. I/O fundamentals.
Interrupt structures.

Suggested Lab work

Programming assignments to practice MS-DOS batch programming, Assembly Process, Debugging, Procedures, Keyboard input, Video Output, File and Disk I/O and Data Structure. Instruction and arithmetic pipelining, superscalar architecture. Reduced Instruction Set Computers. Parallel architectures and interconnection networks.
Prerequisite: IFT 211 Digital Logic Design

MTH 201: Mathematical Methods 1 (2 Units C: LH 30)

Learning Outcomes
At the end of the course students should be able to
1. describe Real-valued functions of a real variable;
2. solve some problems using Mean value Theorem and Taylor Series expansion; and
3. evaluate Line Integral, Surface Integral and Volume Integrals.

Course Contents
Real-valued functions of a real variable. Review of differentiation and integration and their applications. Mean value theorem. Taylor series. Real-valued functions of two and three variables. Partial derivatives chain rule, extrema, Lagrangian multipliers. Increments, differentials and linear approximations. Evaluation of line, integrals. Multiple integrals.

MTH 202: Elementary Differential Equations (2 Units C: LH 30)

Learning Outcomes
At the end of the course, students should be able to
1. define the following: order and degree of a differential equation;
2. describe some techniques for solving first and second order linear and nonlinear equations; and
3. solve some problems related to geometry and physics.

Course Contents
Derivation of differential equations from primitive, geometry and physics order and degree of differential equation. Techniques for solving first and second order linear and non-linear equations. Solutions of systems of first order linear equations. Finite linear difference equations. Application to geometry and physics.

SEN 201: Introduction to Software Engineering (2 Units C: LH 30)

Learning Outcomes
At the end of this course, students should be able to
1. explain the concept of the software life cycle and comprehend the phases of requirements analysis, design, development, testing and maintenance.

2. differentiate amongst the various software development models.
3. use UML for object-oriented analysis and design.
4. describe different design architectures.
5. undertake a group project involving requirements analysis, design, programming and testing.

Course Contents

Software engineering concepts and principles; design, development and testing of software systems. Introduction to software life cycle. Requirements, design and testing. Review of principles of object orientation. Object oriented analysis using UML. Frameworks and APIs. Introduction to the client-server architecture. Analysis, design and programming of a teamproject including user interface considerations.

CSC 299: SIWES I (3 Units C: PH 135)

Learning Outcomes

At the end of this training, students should be able to:

1. explain how a typical computer firm/unit operates;
2. describe the various assignments carried out and the skills acquired during the SIWES period; and
3. submit a comprehensive report on the knowledge acquired and the experience gained during the exercise.

Course Contents

Students are attached to private and public organisations for a period of three months during the second year session long break with a view to making them acquire practical experience and to the extent possible, develop skills in all areas of Computer Science. Students are supervised during the training period and shall be expected to keep records designed for the purpose of monitoring their performance. They are also expected to submit a report on the experience gained and defend their reports.

GOU-EDU 202: Innovative Approaches to Micro-teaching in Enugu Socio-cultural Milieu (2 Units; Compulsory; LH = 15; PH = 45)

Senate-Approved Relevance

Proper preparation of professional teachers with adequate and useful knowledge, skills methods, values and initiative is important in Enugu socio-cultural environment. Godfrey Okoye University exists in this socio-cultural milieu to impart quality knowledge to the teeming youths in this part of the country who are desirous of education. This course is meant to help student teachers to acquire the right method, techniques and confidence which will enable them to teach their students effectively. This is in line with the epistemic dialogue that Godfrey Okoye University is anchored on. Therefore, student teachers who acquire skills, confidence and knowledge in this course can easily impact knowledge to secondary school students using various and relevant methods in teaching any topic and can easily give extra

classes (that is as lesson teachers). This is also in line with the entrepreneurial mindset of Godfrey Okoye University, Enugu, Nigeria.

Overview

Poor performance of students in almost all standardized examinations in both primary and secondary schools call for the need for the development of the course. Recently there is an outcry from the public about this falling standard of education and it is believed that if student teachers acquire confidence and effective methods of teaching it will improve their efficiency in imparting knowledge. This creates the need for proper attention on the teaching methods acquired by student teachers.

The course includes topics such as innovative pedagogy, peer and microteaching. During the course, students will be guided on innovative ways of preparing lesson plan and lecture notes; to develop their educational potentials and desired learning outcomes. The course will expose the student teachers to peer teaching and self-appraisal that will lead them to become effective professional teachers.

Objectives

The objectives of this course are to:

1. Justify the relationship between innovative pedagogy, peer teaching and microteaching.
2. Discuss the concept of peer teaching.
3. Explain the concept of micro-teaching.
4. Describe the process of teaching in a micro-teaching laboratory.
5. Outline the role of instructional methods and instructional materials in micro-teaching.
6. Explain how to write a lesson plan/note.
7. Recognize the different skills in micro-teaching.
8. Analyze supervisory skills and their usefulness in teaching and learning.
9. Illustrate a micro-teaching practicum.
10. Apply pedagogy of peer and micro-teaching in extra classes.

Learning Outcomes

By the end of this course, the student should be able to:

1. Define innovative pedagogy.
2. Give the meaning of peer teaching.
3. Explain the concept of micro-teaching.
4. Discuss micro-teaching and its relevance to teacher education
5. Describe ten importance of peer teaching and micro-teaching.
6. Select five teaching skills involved in teaching objectives
7. Draw out micro-teaching practicum.
8. Describe five teaching methods.
9. Discuss the preparation of a lesson plan.
10. Describe micro-teaching supervisory skills.
11. Explain professionalism in relation to extra classes.

Course Content

Definition of innovative pedagogy. Meaning of peer teaching. Explanation of the concept of micro-teaching. Micro-teaching procedure. Explanation of micro-teaching. Relevance of micro teaching to teacher education. Importance of micro-teaching to student teacher education. Teaching skills involved in teaching objectives. Teaching methods relevant to teachers' education. Instructional materials. Lesson plan. Lesson note. Classroom control. Classroom management. Micro-teaching supervisory skills. Micro-teaching practicum. Laboratory activities. Teaching as a profession in Nigeria.

Minimum Academic Standards

1. Micro-teaching Laboratory.
2. Video tape.
3. Projectors.
4. Computers (1:1 student).
5. Other NUC-MAS requirement facilities.

GOU-EDU 211: Career Guidance for Learners in Enugu Socio- Cultural Environment (2 Units; Compulsory; LH = 15; PH = 45)

Senate -Approved Relevance

Sufficient training of professional career guidance teachers with deep knowledge, skills and positive attitudes is a need in this local environment; Enugu State, where Godfrey Okoye University is situated. This course is meant to help prospective teachers to reach out to those living on the margins, and help them attain their full career potentials or fulfilment in life. Therefore, apart from teaching in formal classroom setting, student teachers who acquire skills and knowledge in this course can easily become home career guidance and own their career guidance centers eventually. This is in consonant with the entrepreneurial mindset of Godfrey Okoye University.

Overview

The intellectual climate from which guidance emerged as an important activity in education is based on the continuous poor performance of students in examinations in both primary and secondary education, social ills, and lack of employment opportunities. More, so, the inability of the education sector to attain to the career guidance needs of those living on the margins in Enugu socio-cultural environment. This calls for the need of the design of this course. Many a time, parents have no time to oversee the academic assignments of their children. This creates the need for proper career guidance in the educational needs of their wards.

This course is designed to enable the prospective teachers to acquire the needed knowledge and skills that will help them to develop their educational potentials, and acquire the desired learning outcomes in guidance and counselling with special emphasis on career guidance to their students and to those living on the margins in Enugu socio-cultural environment. It will give the prospective teachers the opportunity to reach out to many young people on the margins who have no opportunity for proper career guidance. In addition, it will expose the student teachers on the need to own and manage their own guidance and counselling centers and become employers of labour.

Objectives

The objectives of this course are to:

1. Explain the concept of career guidance.
2. Discuss different careers in Enugu socio-cultural environment.
3. Justify different methods of counselling.
4. Outline the role of different methods of counselling.
6. Explain the concept “living on the margins.”
5. Describe how counselling leads people to be self-reliant.
7. Identify the need for innovation in counselling that will lead to student teachers being self- reliant.

Learning Outcomes

By the end of this course, the student should be able to:

1. Define career guidance.
2. Identify at least four career opportunities in Enugu socio-cultural environment.
3. Discuss the relationship between guidance and counselling.
4. Justify the concept of counselling.
5. Discuss at least two methods of counselling
6. Draw out the relationship between marginalization and counselling.

7. State the need for career guidance and counselling in schools.
8. Organize group career guidance and counselling in at least five schools.

Course Content

Meaning and Definition of Guidance. Meaning and Definition of Counselling. Meaning of Guidance and Counselling. Relationship between Guidance and Counselling. History of the Introduction of Guidance and Counselling in Schools. Philosophical roots of Guidance and Counselling. Rational for counselling in schools. Careers in Enugu Socio- Cultural environment. Scope of counselling. Methods of Counselling. Various guidance services rendered in schools. . Various counselling services rendered in schools. Marginalisation and counselling. Types of guidance. Types of counselling. Approaches to guidance. Approaches to counselling.

Minimum Academic Standards

1. Guidance and Counselling Laboratory.
2. Videos.
3. Other NUC – MAS requirement facilities.

300 Level

GST 312: Peace and Conflict Resolution (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to:

1. analyse the concepts of peace, conflict and security;
2. list major forms, types and root causes of conflict and violence;
3. differentiate between conflict and terrorism;
4. enumerate security and peace building strategies; and
5. describe roles of international organisations, media and traditional institutions in peace building.

Course Contents

Concepts of Peace, Conflict and Security in a multi-ethnic nation. Types and Theories of Conflicts: Ethnic, Religious, Economic, Geo-political Conflicts; Structural Conflict Theory, Realist Theory of Conflict, Frustration-Aggression Conflict Theory. Root causes of Conflict and Violence in Africa: Indigene and settlers Phenomenon; Boundaries/boarder disputes; Political disputes; Ethnic disputes and rivalries; Economic Inequalities; Social disputes; Nationalist Movements and Agitations; Selected Conflict Case Studies – Tiv-Junkun; Zango Kartaf, Chieftaincy and Land disputes. Peace Building, Management of Conflicts and Security: Peace & Human Development. Approaches to Peace & Conflict Management --- (Religious, Government, Community Leaders and others). Elements of Peace Studies and Conflict Resolution: Conflict dynamics assessment Scales: Constructive & Destructive. Justice and Legal framework: Concepts of Social Justice; The Nigeria Legal System. Insurgency and Terrorism. Peace Mediation and Peace Keeping. Peace & Security Council (International, National and Local levels) Agents of Conflict resolution – Conventions, Treaties Community Policing: Evolution and Imperatives.

Alternative Dispute Resolution, ADR. Dialogue b). Arbitration, c). Negotiation d). Collaboration. Roles of International Organizations in Conflict Resolution. (a). The United Nations, UN and its Conflict Resolution Organs. (b). The African Union & Peace Security Council (c). ECOWAS in Peace Keeping. Media and Traditional Institutions in Peace Building. Managing Post-Conflict Situations/Crisis: Refugees. Internally Displaced Persons, IDPs. The role of NGOs in Post-Conflict Situations/Crisis.

ENT 312: Venture Creation (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of this course, students, through case studies and practical approaches, should be able to:

1. describe the key steps in venture creation;
2. spot opportunities in problems and in high potential sectors regardless of geographical location;
3. state how original products, ideas, and concepts are developed;
4. develop business concept for further incubation or pitching for funding;
5. identify key sources of entrepreneurial finance;
6. implement the requirements for establishing and managing micro and small enterprises;
7. conduct entrepreneurial marketing and e-commerce;
8. apply a wide variety of emerging technological solutions to entrepreneurship; and
9. appreciate why ventures fail due to lack of planning and poor implementation.

Course Contents

Opportunity Identification (Sources of business opportunities in Nigeria, Environmental scanning, Demand and supply gap/unmet needs/market gaps/Market Research, Unutilised resources, Social and climate conditions and Technology adoption gap). New business development (business planning, market research). Entrepreneurial Finance (Venture capital, Equity finance, Micro finance, Personal savings, Small business investment organizations and Business plan competition). Entrepreneurial marketing and e-commerce (Principles of marketing, Customer Acquisition & Retention, B2B, C2C and B2C models of e-commerce, First Mover Advantage, E-commerce business models and Successful E-Commerce Companies,). Small Business Management/Family Business: Leadership & Management, Basic book keeping, Nature of family business and Family Business Growth Model. Negotiation and Business communication (Strategy and tactics of negotiation/bargaining, Traditional and modern business communication methods). Opportunity Discovery Demonstrations (Business idea generation presentations, Business idea Contest, Brainstorming sessions, Idea pitching). Technological Solutions (The Concept of Market/Customer Solution,

Customer Solution and Emerging Technologies, Business Applications of New Technologies - Artificial Intelligence (AI), Virtual/Mixed Reality (VR), Internet of Things (IoTs), Blockchain, Cloud Computing, Renewable Energy and others. Digital Business and E-Commerce Strategies).

EDU 301: Teaching Practice I (3 Units C: PH 135)

Learning Outcomes

At the end of the course, students should be able to demostrate:

1. knowledge of the subject matter;
2. the necessary Pedagogical skills;
3. acquired understanding of child psychology;
4. the needed attitude towards teaching;
5. proper use of instructional facilities;
6. knowledge of individual differences in actual classroom situations and how to use this knowledge to assist children in real time; and
7. effective classroom management skills.

Course Contents

Effective and responsive teaching practices and interactions as key for all learning in professional teacher preparation. The importance of teaching practice in providing students with an opportunity to apply their pedagogical knowledge and skills in practice. Practical implementation of teaching and learning strategies in the classroom, as applied to the subject area. Micro-teaching prior to students embarking on the exercise.

EDU 302: Educational Measurements, Tests, Research Methods and Statistics (2 Units C: LH 15; PH 45)

Learning Outcomes

At the end of the course, the students should be able to:

1. measure and assess learning outcomes and use the results in decision making and judgments;
2. identify the different domains of learning; develop and use appropriate instruments for measuring each;
3. identify the different kinds of data that can be yielded in different contexts and the appropriate statistical tool for analyzing each type of data;
4. explain the meaning, aim, types, role and processes of research in educational settings. 5. acquire communication skills and skills in reporting of research;
6. carry out hypothesis testing, and employ the knowledge of critical values and error in interpretation of results and making of inferences;
7. gain skills in the use of IBM-SPSS and other relevant packages in the analysis of data; and

8. judge and address ethical issues in research.

Course Contents

Meaning of research, research designs. Problem identification, background and study justification. Theoretical/conceptual framework and review of literature. Sample and sampling techniques. Types of data, data gathering, data processing, data analysis and interpretation. Probability, critical values and error and their place in inferences. Reporting in educational context. Ethical considerations (political, economic religious and cultural) in research. The use of computers in educational research, use of SPSS in data analysis. Measurements and instrumentation. Development of tests, test blue prints, item analysis, reliability and validity of instruments. Domains of learning and taxonomy of cognitive outcomes.

CSC 301: Data Structures (3 Units C: LH 30, PH 45)

Learning Outcomes

At the end of this course, students should be able to

1. discuss the appropriate use of built-in data structures.
2. apply object-oriented concepts (inheritance, polymorphism, design patterns and others) in software design;
3. implement various data structures and their algorithms, and apply them in implementing simple applications;
4. choose the appropriate data structure for modelling a given problem;
5. analyze simple algorithms and determine their efficiency using big-O notation; and
6. apply the knowledge of data structures to other application domains like data compression and memory management.

Course Contents

Primitive types, Arrays, Records Strings and String processing, Data representation in memory, Stack and Heap allocation, Queues, TREES. Implementation Strategies for stack, queues, trees. Run time Storage management; Pointers and References, linked structures.

CSC 308: Operating System (3 Units C: LH 30, PH 45)

Learning Outcomes

At the end of this course, students should be able to

1. recognize operating system types and structure;
2. describe OS support for processes and threads;
3. recognize CPU scheduling, synchronization, and deadlock;
4. resolve OS issues related to synchronization and failure for distributed systems;
5. explain OS support for virtual memory, disk scheduling, I/O, and file systems;

6. identify security and protection issues in computer systems; and
7. use C and Unix commands, examine behaviour and performance of Linux, and develop various system programs under Linux to make use of OS concepts related to process synchronization, shared memory, mailboxes, file systems and others.

Course Contents

Fundamentals of operating systems design and implementation. History and evolution of operating systems. Types of operating systems. Operating system structures. Process management: processes, threads, CPU scheduling, process synchronization. Memory management and virtual memory. File systems; I/O systems; Security and protection; Distributed systems; Case studies.

Suggested Lab Work:

Practical hands-on engagement to facilitate understanding of the material taught in the course. All the process, memory, file and directory management issues will be demonstrated under the LINUX operating system. Also UNIX commands will be briefly discussed. Alternatively, hands-on exposure may be through the use of operating systems developed for teaching, like TempOS, Nachos, Xinu or MiniOS. Another possibility is through programming exercises that implement and simulate algorithms taught. Simulation of CPU scheduling algorithms, producer-consumer problem, memory allocation algorithms, file organization techniques, deadlock algorithms and disk scheduling algorithms.
Prerequisite: CSC 301 Data Structures

CSC 309: Artificial Intelligence (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain AI fundamentals, concepts, goals, types, techniques, branches, applications,
2. understand AI technology and tools.
3. discuss intelligent agents, their performance, examples, faculties, environment and architectures, and determine the characteristics of a given problem that an intelligent
4. system must solve.
5. describe the Turing test and the “Chinese Room” thought experiment, and differentiate between the concepts of optimal reasoning/behaviour and human-like reasoning/behaviour.
6. describe the role of heuristics and the trade-offs among completeness, optimality, time complexity, and space complexity.
7. analyze the types of search and their applications in AI and describe the problem of combinatorial explosion of search space and its consequences.

8. demonstrate knowledge representation, semantic network and frames along with their applicable uses.
9. practice Natural Language Processing, translate a natural language (such as English) sentence into a predicate logic statement, convert a logic statement into clause form, apply resolution to a set of logic statements to answer a query.
10. analyze programming languages for AI and expert systems technology, and employ application domains of AI.

Course Contents

Overview of Artificial Intelligence. History of AI. Goals of AI. AI Technique. Types of AI. Branches and applications of AI. Advantages and Disadvantages. Introduction to Intelligent Agents. Agent Performance, Examples of Agents, Agent Faculties, Rationality, Agent Environment. Agent Architectures. Search. General Classes of AI Search Algorithm Problems. Problem Solving by Search. Types of AI Search Techniques and Strategies. Introduction to the types of problems and techniques in AI. Problem-Solving methods. Major structures used in AI programs. Knowledge Representation. KR and Reasoning Challenges. KR Languages. Knowledge representation techniques such as predicate logic, non-monotonic logic, and probabilistic reasoning. Semantic Network - types of relationships, semantic network inheritance, types and components. Introduction to Frames. Natural Language Processing (NLP). Introduction to natural language understanding and various syntactic and semantic structures. Introduction to Expert Systems - characteristics, components, types, requirements, technology, development. Programming Languages for AI. Introduction to computer image recognition.

CSC 322: Computer Science Innovation and New Technologies (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to

1. identify the key elements of the process of founding a start-up firm;
2. state and explain the different aspects and challenges of entrepreneurship;
3. list and explain the skills required for technology-driven innovation and entrepreneurship in the age of disruptive technologies;
4. generate an innovative business and build a business plan around it;
5. identify different strategies for raising capital to support an innovation;
6. employ modern technologies to enhance or disrupt an existing business model; and
7. assess and critique a given business proposal from different perspectives.

Course Contents

Aims to equip students with concepts and skills required for developing, planning and managing technology-based innovations. Topics covered include different aspects and challenges of entrepreneurship, idea

development and validation, strategy, building a business plan, raising capital and growing a business.

CYB 201: Introduction to Cyber Security and Strategy (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to:

1. explain cybersecurity concepts, its methods, elements, and terminologies of cyber security -cyber, security, threat, attack, defence, and operations;
2. describe common cyber-attacks and threats, cyber security issues, challenges and proffered solutions, and build an enhanced view of main actors of cyberspace and cyber operations;
3. apply the techniques for identifying, detecting, and defending against cybersecurity threats, attacks and protecting information assets;
4. explain the impact of cybersecurity on civil and military institutions, privacy, business and government applications;
5. identify the methods and motives of cybersecurity incident perpetrators, and the countermeasures employed by organizations and agencies to prevent and detect those incidences and software application vulnerabilities; and
6. state the ethical obligations of security professionals, evaluate cybersecurity and national security strategies to the typologies of cyber-attacks that require policy tools and domestic response, and define the cybersecurity requirements and strategies evolving in the face of big risk.

Course Contents

Basic concepts: cyber, security, confidentiality, integrity, availability, authentication, access control, non-repudiation and fault-tolerant methodologies for implementing security. Security policies, best current practices, testing security, and incident response, Risk management, disaster recovery and access control. Basic cryptography and software application vulnerabilities. Evolution of cyber-attacks. Operating system protection mechanisms, intrusion detection systems, basic formal models of security, cryptography, steganography, network and distributed system security, denial of service (and other) attack strategies, worms, viruses, transfer of funds/value across networks, electronic voting, secure applications. Cybersecurity policy and guidelines. Government regulation of information technology. Main actors of cyberspace and cyber operations. Impact of cybersecurity on civil and military institutions, privacy, business and government applications; examination of the dimensions of networks, protocols, operating systems, and associated applications. Methods and motives of cybersecurity incident perpetrators, and the countermeasures employed by organizations and agencies to prevent and detect those incidences. Ethical obligations of security professionals. Trends and development in cybersecurity. Software application vulnerabilities. Evolution

of cybersecurity and national security strategies, requirements to the typologies of cyber-attacks that require policy tools and domestic response. Cybersecurity strategies evolving in the face of big risk. Role of standards and frameworks.

DTS 304: Data Management (3 Units C: LH 30; PH 45)

Learning Outcomes

At the end of the course, students should be able to

1. identify the careers/roles associated with information management;
2. explain the characteristics that distinguish the database approach from the approach of programming with data files;
3. describe the components of a database system and give examples of their use.
4. describe concepts in modeling notation;
5. describe the differences between relational and semi-structured data models;
6. apply the modeling concepts and notation of the relational data model;
7. explain and demonstrate the concepts of entity integrity constraint and referential integrity constrain;
8. apply queries, query optimizations and functional dependencies in relational databases;
9. describe properties of normal forms and explain the impact of normalization on the efficiency of database operations;
10. describe database security and integrity issues and their importance in database design; and
11. explain the concepts of concurrency control and recovery mechanisms in databases.

Course Contents

Information Management Concepts: Information storage & retrieval, Information management applications, Information capture and representation, analysis & indexing, search, retrieval, information privacy; integrity, security; scalability, efficiency and effectiveness. Introduction to database systems: Components of database systems DBMS functions, Database architecture and data independence use of database query language. Conceptual models. Relational data models. Semi-structured data models. Relational theory and languages. Database Design. Database security and integrity. Introduction to query processing and optimization. Introduction to concurrency and recovery.

Suggested Lab work

Programming assignments to learn database design using CASE tools. Introduction to backend/Server-based Relational Database Management System (RDBMS). Learning Standard SQL (interactive/embedded). Introduction and programming assignments on Front-End tools.

Programming team projects to design and develop real life database systems using the learned tools.
Prerequisite: CSC 203 Discrete Structures I

ICT 305: Data Communication Systems and Network (3 Units C: LH 30, PH 45)

Learning outcomes

At the end of this course, students should know

1. data transmission over layered networks; 2. internet technologies and protocols; and
3. network Operating System.

Course Contents

Types and sources of data, simple communications network, transmission definitions, one way transmission, half duplex transmission, transmission codes, transmission modes, parallel transmission, serial transmission, bit synchronization, character synchronization, character synchronization, synchronous transmission, asynchronous transmission, efficiency of transmission, error detection methods and data compression. Protocols: Introduction to network protocol. Seven Layer ISO-OSI standard protocols and network architecture.

Transport protocols, session services protocols, and other protocols. Institute of Electrical and Electronics Engineering 802 standards. Error control and Data Compression: Forward Error Control; error detection methods; parity checking; linear block codes, cyclic redundancy checking; feedback error control, data compression, Huffman coding and dynamic Huffman coding. Local Area Networks: medium access control techniques – Ethernet, token bus and token ring; LAN standards; fibre distributed data interface, metropolitan area network. Peerto-peer, Client Server. Client-Server Requirements: GUI design standards, interface independence, platform independence, transaction processing, connectivity, reliability, backup, and recovery mechanisms. Information Network Software; Features and benefits of major recovery mechanisms. Information Network Software: features and benefits of major Network Operating Systems. Network OS: (such as, Novell NetWare, UNIX/LINUX, OS/2 & Windows NT). TCP/IP and Network OS. INTERNET: Definition, architecture, services, Internet addressing. Internet protocol, IPv4, IPv6. Internet programming, Intranet. System administration, and security issues.

CSC 399: SIWES II (3 Units C: PH 135)

Learning Outcomes

At the end of this training, students should be able to:

1. explain how a typical computer firm/unit operates;
2. describe the various assignments carried out and the skills acquired during the SIWES period; and

3. submit a comprehensive report on the knowledge acquired and the experience gained during the exercise.

Course Contents

Students are attached to private and public organisations for a period of three months during the second year session long break with a view to making them acquire practical experience and to the extent possible, develop skills in all areas of Computer Science. Students are supervised during the training period and shall be expected to keep records designed for the purpose of monitoring their performance. They are also expected to submit a report on the experience gained and defend their reports.

GOU-EDU 303: Psychology of Education in South-East Nigeria (2 Units; Compulsory; LH = 15; PH = 45)

Senate-Approved Relevance

Adequate preparation of professional teachers with useful knowledge, skills, values, initiatives and understanding and application of human knowledge to the principles of teaching and learning is important in Enugu, Nigeria, where Godfrey Okoye University, is located. This course is meant to help student educators to acquire the right techniques which is important for understanding the learner, his/her socio-economic environment and which will enable the student educators to teach their students effectively. This is in line with the epistemic dialogue that Godfrey Okoye University is anchored on. Therefore, during the course of teaching and learning, the student educators who acquired skills and knowledge in this course can easily find out individual differences among the students and guide the students to put in their best thereby preventing students in their studies dropping out of school.

Overview

The concept of student dropout in educational system has aroused interest of many professional academics and the public in general. Students may drop out of schools with or without the consent of the school either to another school or to sit at home. Some of the reasons for dropout from school are poor academic performance, lack of sufficient individualized attention and conflict between school and household duties. If student educators acquire the psychological skills that will make them understand the individual differences and needs of their students' they will teach more effectively, and dropout from schools will reduce or curbed entirely. This creates the need for proper attention on the application of principles and techniques of psychology to the solution of problem in the classroom.

This course is designed to enable the student educators acquire skills to understand human behaviour in relation to teaching and learning and the environment in which education takes place. It will give the student teachers the opportunity to understand the learner, apply the learning theories of motivation and memory processing in effective teaching and learning. It will expose the student educators to the need for home teaching and manage their own learning centres and become employees of labour.

Objectives

The objectives of this course are to:

1. 2. Justify the need for psychology of teaching and learning.
3. Discuss various theories of learning and their implications for the classroom teacher.
4. Examine the concept of dropout.

5. Identify the development patterns that influences the learners' behaviour.
6. Describe the theories of motivation and their application to the classroom.
7. Explain memory processing, encoding and retrieval process.
8. Analyze forgetting and remembering
9. Discuss the transfer of learning and its implications for the classroom.
10. Apply psychology of teaching and learning to home studies.

Learning Outcomes

By the end of this course, the student should be able to:

1. Define psychology of teaching and learning.
2. Discuss theories of learning and their implications to the classroom teacher.
3. Describe the relevance of motivation to classroom learning.
4. Select at least five adequate learning experiences and materials for school and home learners.
5. Draw out the relationship between learning and individual differences and fashioning appropriate techniques for solving the problems resulting from such differences.
6. Demonstrate how learning process can be effectively guided and preserved.
7. Distinguish developmental characteristics of the learners and fashion a way of solving certain problems resulting from such characteristics.
8. Discuss professionalism in relation to the study.

Course Content

Meaning of psychology. Meaning of educational psychology. Critical analysis of developmental patterns. Characteristics of individuals. Theories of learning. Implication learning theories to the classroom teacher. Concept of dropout from school. Theories of motivation. Motivational problems encountered in the classroom. How to solve the motivational problems. Issues of dropout from school. Enugu experience. Memory processing. Forgetting. Remembering. Classroom management. Need for home study. Professionalism in home school teaching. Learning establishment of a study centre. Students' attitudes. Students' aptitudes. Students' interest.

Minimum Academic Standards

1. Projectors.
2. Other NUC-MAS requirement facilities.

GOU-EDU 305: Indigenous Educational Resources for Curriculum Implementation (2 Units; Compulsory; LH = 15; PH = 45)

Senate-Approved Relevance

This course is designed for the training of highly skilled and knowledgeable education graduate teacher on local educational resource for teaching and learning in Enugu, Nigeria which aligns properly with the mission and vision of Godfrey Okoye University, Enugu to produce graduate teachers that could contribute maximally to high quality education entrepreneurship, and sustainable socio-economic human development. This is also in agreement with Nigeria SDG for equitable, inclusive and sustainable education.

Overview

Presently students of education are not made to learn about skills for production of instructional materials from local resources like palm trees and other forest trees and soil for teaching and learning various school subjects. In terms of impacting the knowledge, these skills would enable graduate teachers to utilize the local environmental resources to produce instructional materials for schools here and outside Enugu.

The course therefore is designed to adequately expose graduate education teachers of Godfrey Okoye University to look inward in the production of various educational instructional materials from local resources for Enugu and Nigerian schools.

Objectives

The objectives of the course are to:

1. Define the concept curriculum.
2. Discuss problems encountered in defining curriculum.
3. Explain the aim and scope of curriculum.
4. Describe the different programs in education curriculum.
5. Define resources in education curriculum.
6. Outline the different types of resources in education curriculum.
7. Describe improvisation of instructional materials in education curriculum.
8. Describe the various local educational resources for teaching and learning in Enugu.
9. Discuss the merits and demerits of utilizing local educational resource in production of instructional materials.
10. Describe the main qualities of a good instructional material.

Learning Outcomes

By the end of this course, the student should be able to:

1. Define the concept curriculum in three different ways.
2. Explain at least five problems encountered in defining education curriculum.
3. Describe at least five aims and scope of education curriculum.
4. Describe the three main programs of education curriculum.
5. Explain at least five local educational resources in education curriculum.
6. Differentiate at least five local educational resources in education curriculum.
7. Describe the meaning of improvisation of instructional materials in teaching and learning.

8. Explain at least five local educational resources for producing teaching and learning materials.
9. Describe at least five merits and demerits of using local educational resource in production of instructional materials.
10. Describe at least five qualities of good instructional materials.

Course Content

Definition of terms. An overview of the course. Aim of the course. Objective and Contents. Learning experiences. Scope of the course. Education and curriculum. Curriculum programmes. Programme of studies. Program of guidance. Program of activity. Resources in education curriculum. Human and material resource from plant, soil etc. Meaning of instructional materials. Improvisation of instructional materials. Qualities of good instructional material: durable, clarity cost etc. Advantages of local educational resources.

Minimum Academic Standard

a) Micro teaching laboratory.

b) Computers (1:5 students).

c) Other NUC – MAS requirement facilities.

400 LEVEL

EDU 400: Project (3 Units C: PH 135)

Learning Outcomes

At the end of the course, students should be able to:

1. identify researchable project topics on contemporary problems in relevant subject specialization in education; and
2. search and review literature pertinent to identified topical issues.

Course Contents

Application of knowledge and skills acquired in research methods, statistics and evaluation in identifying and proffering solutions to educational problems. Working independently under the guidance of a Project Supervisor. Planning and execution of a well-conceptualized research and presenting a written report on the study conducted.

EDU 401: Teaching Practice II (3 Units C: PH 135)

Learning Outcomes

At the end of the course, students should be able to demonstrate:

1. knowledge of the subject matter;
2. the necessary Pedagogical skills;

3. acquired understanding of child psychology;
4. the needed attitude towards teaching;
5. proper use of instructional facilities;
6. knowledge of individual differences in actual classroom situations and how to use this knowledge to assist children in real time; and
7. effective classroom management skills.

Course Contents

Effective and responsive teaching practices and interactions are key for all learning in professional teacher preparation. The importance of teaching practice in providing the students with an opportunity to apply their pedagogical knowledge and skills in practice. Practical implementation of teaching and learning strategies in the classroom, as applied to the subject area. Micro-teaching before students embark on the exercise.

CSC 401: Algorithms and Complexity Analysis (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to

1. explain the use of big O, omega, and theta notation to describe the amount of work done by an algorithm;
2. use big O, omega, and theta notation to give asymptotic upper, lower, and tight bounds on time and space complexity of algorithms;
3. determine the time and space complexity of simple algorithms;
4. deduce recurrence relations that describe the time complexity of recursively defined algorithms;
5. solve elementary recurrence relations;
6. for each of the strategies (brute-force, greedy, divide-and-conquer, recursive backtracking, and dynamic programming), identify a practical example to which it would apply;
7. use pattern matching to analyze substrings; and
8. use numerical approximation to solve mathematical problems, such as finding the roots of a polynomial.

Course Contents

Basic algorithmic analysis: Asymptotic analysis of Upper and average complexity bounds; standard Complexity Classes Time and space trade-offs in algorithms analysis recursive algorithms. Algorithmic Strategies: Fundamental computing algorithms: Numerical algorithms, sequential and binary search algorithms; sorting algorithms, Binary Search trees , Hash tables, graphs & its representation. Prerequisite: CSC 203 Discrete Structures I

INS 401: Project Management (2 Units C: LH 30)

Learning Outcomes

At the end of this course, students should be able to

1. describe project management planning;
2. describe project scheduling;
3. explain management of project resources;
4. discuss project procurement, monitoring and execution; and
5. explain project communication and time management.

Course Contents

Introduction to Project Management; The Project Management Lifecycle: Project management and systems development or acquisition, The project management context, Technology and techniques to support the project management lifecycle, and Project management processes; Managing Project Teams: Project team planning, Motivating team members, Leadership, power and conflict in project teams, and Managing global project teams; Managing Project
Communication and enhancing team communication; Project Initiation and Planning; Managing Project Scope: Project initiation, How organizations choose projects, Activities, and Developing the project charter; Managing Project Scheduling: Common problems in project scheduling, and Techniques for project scheduling; Managing Project Resources: Types of resources (human, capital, time), and Techniques for managing resources; Project quality and tools to manage project quality; Managing project risk and tools for managing project risk; Managing Project Procurement: Alternatives to systems development, External acquisition, Outsourcing-domestic and offshore, Steps in the procurement process, and Managing the procurement process; Project Execution, Control and Closure: Managing project execution, Monitoring progress and managing change, Documentation and communication, and Common problems in project execution; Managing Project Control and Closure: Obtaining information, Cost control, Change control, Administrative closure, Personnel closure, Contractual closure and Project auditing

CSC 402: Ethics and Legal Issues in Computer Science (2 Units C: LH 30)

Learning Outcomes

At the end of the course, students should be able to

1. understand laws and regulations related to ethics;
2. identify and explain relevant codes of ethics for computing practice;
3. identify social and ethical issues in different areas of computing practice;
4. review real-life ethical cases and be able to develop ethical resolutions and policies; 5. explain the consequences of ignoring and non-compliance with ethical provisions; and
6. develop a sound methodology in resolving ethical conflicts and crisis.

Course Contents

Addresses social, ethical, legal and managerial issues in the application of Computer Science to the information technology industry. Through seminars and case studies, human issues confronting Computer Science graduates

will be addressed. Topics include managerial and personal ethics, computer security, privacy, software reliability, personal responsibility for the quality of work, intellectual property, environment and health concerns, and fairness in the workplace.

GOU-EDU 403: Ethno-Pedagogy and Curriculum of Non-School Environment (2 Units; Compulsory; LH = 30; PH = 0)

Senate-Approved Relevance

Adequate formation of professional teachers with sustainable knowledge, skills, values, and positive attitudes is a need in the local environment of Enugu where Godfrey Okoye University is located. This course is meant to help student teachers to reach out to every learner in their homes and help them to achieve their educational needs. This is in line with the epistemic dialogue that Godfrey Okoye University is anchored on. Therefore, apart from teaching in the formal classroom setting, students who acquire skills and knowledge in this course can easily become home teachers and own their own study centres. This is also in line with the entrepreneurial mind-set of Godfrey Okoye University Enugu, Nigeria.

Overview

Continuous poor performance of students in formal school setting in almost every standardised examination in both primary and secondary education calls the need for the development of this course. In recent times, parents are always busy with work. Many a time, they find it difficult to look at the academic work of their wards. This creates the need for proper attention on the educational needs of their children.

This course is designed to enable the student teachers acquire the required knowledge and skills to help learners to develop their educational potentials and desired learning outcomes. It will give the student teachers the opportunity to manage home lessons. More so, it will expose the student learners on the need to own and manage their own learning centres and become employers of labour.

Objectives

The objectives of this course are to:

1. Justify the relationship between ethno-pedagogy and curriculum.
2. Explain the concept of non-school environment.
3. Discuss curriculum as a process for transferring knowledge into application.
4. Analyse the relevance of curriculum based on the national policy on education.
5. Explain selection of objectives and learning experiences in curriculum.
6. Outline the role of instructional methods and materials in curriculum.
7. Explain evaluation processes in curriculum.
8. Identify the need for curriculum innovation in Enugu.
9. Apply ethno-pedagogy at home schools.

Learning Outcomes

By the end of this course, the student should be able to:

1. Define ethno-pedagogy.
2. Give the meaning of curriculum.
3. Discuss the relevance of curriculum based on the national policy on education.
4. Draw out the relationship between curriculum and instruction based on the three domains of learning.
5. Select adequate learning experiences and materials for home school learners.
6. Identify at least five scaffolding activities for home school teaching and learning.
7. Explain curriculum innovation in the subject area.
8. Name three instruments used in evaluating learners' performance in home school teaching and learning.
9. Discuss professionalism in relation to home school teaching and learning.
10. Identify five ways of public relations regarding home school teaching and learning.
11. Suggest three methods of establishing study centres.

Course Content

Concept of ethno-pedagogy. Meaning of curriculum. Concept of non-school environment. Critical analysis of curriculum in terms of their relevance and national goals. Relationship between curriculum and instruction in terms of objectives specification. Selection of learning experiences. Learning materials. Methods and media of instruction. Scaffolding activities. Evaluation. Curriculum innovation in a subject matter area with particular reference to Enugu experience. Professionalism in home school teaching and learning. Public relations in home school teaching and learning. Establishment of study centres. Application of ethno-pedagogy at home schools.

Minimum Academic Standards

1. Microteaching Laboratory.
2. Computers (1 computer per student).
3. Other NUC-MAS requirement facilities.

GOU-CSE 403: Wireless Communication and Mobile Computing Technology in Education (2 Units; Compulsory; LH = 15; PH = 45)

Senate- Approved Relevance

New communication technologies especially wireless communication and mobile computing encourage communication between students and teachers and increase learning efficiency due to technology, classroom activates "feel" more real world and relevant. So. students take these activities more seriously even if they are not good in studies. It especially improves higher student's critical thinking skills with the utilization and changes in the information and communication technology. Furthermore, this responds to the United Nations Sustainable

Development Goals 4, which ensures inclusive and equitable quality education and promotes lifelong learning opportunities for all.

Overview
Mobile computing is becoming an important part of health care's information technology (IT) tool box. Technology advances and the proliferating health care application indicates that mobile computing will find a secure place for both students and lecturers. It is not too early for educationists to investigate the benefits it can offer and how it would fit in current information system, workflow and care practices

Mobile computing is not a single technology but a combination of three components (handheld computing device, connecting technology and a centralized information system) each with different implementation of mobile computing requires employing all these components in the way that best suits the work and environment of the end user.

Objectives
The Objectives of the Course are:
1. Describe the history of networks and their evolution in teaching and learning.
2. List the various types of network communications methodologies.
3. Describe the various forms of network associated with teaching.
4. Describe different network topologies in teaching computer education.
5. Define different types of networks needed and its learning outcome.
6. List different network standard and protocols in teaching and learning.
7. Explain wireless communication methodologies.
8. Explain networking as a logical model concept in teaching and learning.
9. List various network hardware needed in teaching method.
10. Describe the criteria involved in teaching network hardware.

Learning Outcomes
On completion of the course, the students should be able to:
1. Describe at least two (2) history of network and their evolution in teaching and learning.
2. List at least five (5) various types of network communications methodologies.
3. Describe three (3) different forms of network associated with teaching.
4. Describe five (5) deferent networks topologies needed' in teaching computer.
5. Define three (3) different types of networks needed and its learning outcome.
6. List four (4) different networks standard and protocol in teaching and learning.
7. Explain at least two (2) wireless communication methodologies.
8. Explain five (5) networking rules as a logical concept in teaching.
9. List two (2) network hardware mostly needed in teaching and learning.
10. Describe three (3) criteria needed in teaching network hardware.

Course Content
Overview of wireless technology. Wireless networks. ADHOC networks. Wireless devices. Personal digital assistants. Wireless standards. Wireless LANS overview architecture. Wireless LAN components. Wireless personal area network. Bluetooth Architecture and components. Security of Bluetooth. Problems with the Bluetooth standard and security of Bluetooth. Problems with the Bluetooth standard security. Wireless handheld devices. Emerging wireless

technologies. Educational applications. Use of mobile computing in education. Mobile database in educational environment. Mobile application and information sharing

MINIMUM ACADEMIC STANDARD:

- Functional Computer
- Laboratory
- Classrooms, white boards, projectors, tables and seats
- Other NUC-MAS requirements facilities.

GOU-CSE 411: Teaching the Development of Mobile Applications (2 Units; Compulsory; LH =15; PH= 45)

Senate-Approved Relevance

Teaching the would-be teacher in mobile app development is apt in computer education. Mobile app development is rapidly growing as a result of high demand and migration from the analogue to digital operations. Today, mobile devices—and the mobile applications that unlock their value—are the most popular way for people and businesses to connect to the internet. To stay relevant, responsive and successful, organizations need to develop the mobile applications that their customers, partners and employees demand. Upon completion of this course, the student will be equipped with the basic knowledge and ideas of teaching mobile app development that can enhance their employability and make them entrepreneurial especially in Enugu State where there are many producers of similar products operating with high level of competition, thereby placing high demand of who should teach this technology. This is in line with the mission of Godfrey Okoye University to produce graduates that are equipped with skills revolution underpinned by science, technology and innovation.

Overview

In a day and age where mobile-based applications and searches are more prominent than any other medium, it makes sense for businesses to tap into the demand with a war-footed approach. In this regard, Mobile Development Certification and Training courses are in great demand globally. Especially Android and iOS-related mobile development certification training courses are some of the most sought-after professional courses for professionals across industry sectors, hence the need for a computer education student to be taught on how to teach this technology. This course is design to help students understand how to teach the process of making software for smartphones, tablets and digital assistants, most commonly for the Android and iOS operating systems.

Objectives

The objectives of the course are to:

1. Explain the concept of mobile app and its development
2. Describe the basic elements of developing mobile app
3. Discuss the factors to be considered before choosing a platform.
4. Discuss the difference between android and iOS (Native apps and Hybrid apps)

5. Describe the teaching techniques to explain the strategies of offload processing to the cloud.
6. Describe the teaching techniques to explain the methods of extending app with advanced cloud services.
7. Explain the teaching techniques to explain the process of installation of the mobile app on mobile devices.
8. Explain the teaching techniques needed to discuss the steps in evaluating the efficiency of mobile app in real operation.
9. Discuss the place of internet in mobile app.
10. Discuss the legal implication of mobile app in business world.

Learning Outcomes

On completion of the course, the student should be able to:

1. Explain how to teach the concept of mobile app at least in two different ways.
2. Explain at least five educational methods to teach basic elements that are concerned with the development of mobile app.
3. Discuss at least five educational methods of teaching the factors to be considered before developing a mobile app.
4. Discuss at least five educational strategies of teaching the differences between android mobile app and iOS apps.
5. Describe at least four educational strategies of teaching the process of extending apps with advanced cloud service.
6. Discuss at least two educational methods of teaching installation of mobile apps.
7. Explain at least five pedagogical approaches to teaching the elements to be evaluated in appraising a mobile app efficiency.
8. Explain at least three teaching methods in discussing the basic functions of the internet in mobile app development.
9. Discuss at least five pedagogical process of explaining legal guidelines governing the development of mobile app development.

Course Content

Educational techniques of teaching the meaning of mobile apps. Methods of teaching the elements in developing mobile apps. Educational methods of teaching android apps and ios apps development. Teaching methods suitable for teaching the characteristics and differences between android and iOS app development. Educational techniques of teaching offload processing to the cloud. Methods of teaching advanced cloud services. Methods of teaching test running the mobile app. Methods of teaching the installation of mobile apps. Methods of teaching the evaluating the mobile apps. Methods of teaching the mobile apps and the internet. Methods of teaching coding the mobile apps. Pedagogical methods of teaching the operating system and native APIs. Methods of teaching hybrid mobile application development. Methods of teaching the use of JAVA, SWIFT, C# and HTML5. Apps load carriage. Educational techniques of teaching Preinstallation of mobile apps. Methods of teaching the steps in accessing the mobile apps from play store. Methods of teaching the legal regulation on app development.

Minimum Academic Standards

1. Computer system
2. Projector
3. Other NUC –MAS requirement facilities.

GOU- SCE 414: Data Mining and Security Issues in Education (2 Units; Elective; LH = 15; PH = 45)

Senate-Approved Relevance

Educational system operation in a highly competitive and complex environment, with rapid amount of data collected and stored in many educational institutions, is growing too big and educational data analysis could not be performed manually anymore. Educational Data Mining (EDM) is a relatively new discipline that emerged from the application of data mining techniques in educational data. The goal of EDM is to improve the educational process, to explain educational strategies `for better decision-making. Data mining and data analysis has to collect data collected during teaching and learning in order to discover previously unknown information relationship and patterns in large data repositories. This is in accordance with the vision of Godfrey Okoye University as a center of academic excellence and in congruence with the Sustainable Development Goals 2 for the year 2063.

OVERVIEW:

Educational researchers are increasingly interested in applying data mining approaches. But to date, there has been no overarching exposition of their methodological advantages and disadvantages to the field.

This is partly because the use of data mining education research is relatively new; so its value and course venues are not yet well understood. This course underscores the methodological merits of data mining education.

Objectives

The Objectives of the Course are:

1. Define data mining
2. Describe security issues associated in teaching and learning.
3. List the basic concepts in learning data mining.
4. Explain data warehousing operations in teaching and learning data mining.
5. List the algorithms that are associated to security issues in Education.
6. Describe the classes and sequential patterns methodologies.
7. Define technological infrastructure in teaching database.
8. List the authentication and password securities in teaching computer education.
9. Explain the steps associated in learning encryption.
10. Define data interception and data loss in relationship to teaching and learning.

Learning Outcomes

The Objectives of the Course are:

1. Define two (2) definitions of data mining.
2. Describe at least four (4) security issues associated in teaching and learning.
3. List three (3) concept methodologies of data mining.
4. Explain two (2) data warehousing operations in teaching data mining.
5. List five (5) steps in algorithm that are associated to security issues.
6. Describe at least two (2) classes and sequential patterns methodologies.
7. Define three (3) technological infrastructure in teaching database.
8. List at least three (3) authentication and password securities in teaching computer education.
9. Explain two (2) steps associated with learning encryption.
10. Define four (4) data interception and data loss in relationship to teaching and learning.

Course Content

The concept of data. Information and knowledge of security issues. Concept of data mining. Data mining software. Application of security issues. Problem solving and data analysis**.** Data warehousing operations of data mining. Classes and clusters in security issues. Association and sequential patterns**.** Different levels of analysis**.** Genetic algorithms. Sequential decision tree**.** Data visualization**.** Technological infrastructure required in data mining**.** Digital security**.** Authentication and pass wording**.** Data interception and data loss.

Minimum Academic Standard
Well-equipped computer lab. Other NUC and MAS requirements.

GOU-CSE 415: Pedagogical Approach in Computer Graphics (2 Units; Elective; LH = 15; PH = 45)

Senate Approved Relevance
The advancement of technology in different sectors of designing, architectural drawings and graphic arts through the use of computer to achieve virtual reality are glaringly noticed in this present age. Moreover, virtual reality creation in graphic world today such as in production of 2D and 3D objects used in different designing fields, in medical imaging (x-rays), surgical simulation, flight and motor simulators etc. computer graphics is fast becoming an indispensable tool in education. This course is intended to provide computer science education graduates the opportunity of being highly skilled in production and designing in an area like Enugu State with high demand for computer science teachers and computer graphic designers who can work in other areas such as hospitals, entertainment industries etc. This is in accordance with the vision of Godfrey Okoye University as a center of academic excellence.

Overview
Before the advent of computer graphics, graphic arts were time-consuming and very expensive. Then, many artists toiled with building of prototypes and clay models before they could get actual models of what they intend to design and this was posing very difficult task on them. However, using computer graphics to virtual reality has changed the game.
This course is designed to expose students to interactive view of designing and building arts. It will also help them to acquire the skills in using modified models of shapes through the use of computer graphics.

Objectives
The objectives of this course are to:

1. Explain computer graphics.
2. Identify areas where computer graphics can be applied.
3. Identify the importance of teaching computer graphics to computer science educator.
4. Describe computer graphics models.
5. Identify types of computer graphics.
6. Discuss hardware and software aspects of computer graphics.
7. Explain 2-Dimensional (2D) and 3-Dimensional Transformation Perspective.
8. Discuss types of transformation perspective.
9. Explain computer graphics algorithms.

Learning Outcomes
By the end of this course, students should be able to:

1. Explain computer graphics.
2. Identify three areas where computer graphics can be applied.

3. Discuss the importance of teaching computer graphics to computer science educator.
4. Describe two computer graphics models.
5. Identify three types of computer graphics.
6. Discuss hardware and software aspects of computer graphics.
7. Explain 2-Dimensional (2D) and 3-Dimensional Transformation Perspective.
8. Discuss two types of transformation perspective.
9. Explain computer graphics algorithms.

Course Content
Computer graphics. Types of computer graphics. Computer graphics models. Areas of application. Hardware aspects of computer graphics. Plotters microfilm. Plotters display. Graphic tablets. Changing images light pen interaction. Software aspects of computer graphics. Transformation perspective. Two- and three-dimensional transformation perspective. Clipping algorithms. Hidden live removal. Bolded surface removal. Warrock's Algorithm and method. Data reduction for graphical input. Introduction to hand writing and character recognition. Contouring ring structures versus doubly linked lists. Hierarchical structures. Data structure. Organization for interactive graphics.
Minimum Academic Standard
Images and shapes of 2D and 3D of objects
Flight simulator pictures
Computer graphics software

GOU-SCE 421: Pedagogical Approach in Teaching and Learning of Computer Networking (2 Units; Compulsory; LH=30; PH=0)

Senate-Approved Relevance
The Computer Networking Movement compasses a wide range of domains, some of which overlap computer-based education. For example, the computer-based education movement currently advocates extensive network links across schools, libraries, art museums and research centers. Computer networking pushes this vision even further advocating the weaving together of all institutional sectors into one great electronic web. This web is sometimes referred to as cyber space. For education, it helps to develop complex learning environments employing different tasks as well as media mixes with multimedia, synchronous and asynchronous text-based communication or video crafting. The goal of this course is line with the mission of Godfrey Okoye University to produce graduate teachers who excel in knowledge and character and who are well equipped for the labor market.
Overview
The pedagogical way of teaching computer networking is about connecting computers to allow students to communicate with each other. Computers are connected using networks, which are available now with the advent of mobile computing.
The course unveils different pedagogical approaches to teaching computer networking. It will expose students to the use of cable or wireless media, and the use of hardware and software to connect computers and tools in any network.
SPECIFIC OBJECTIVES:
The objectives of this course are:
1. Define Computer Networking.
2. List the steps involved in teaching and learning computer Networking.
3. Describe the topology in computer with its association to teaching and learning.'

4. List the geographical span in teaching computer networking.
5. Describe the advantages of students in teaching computer networking.
6. Explain the components needed in teaching computer networking.
7. Explain the examples of computer networking.
8. Describe the basic concepts of computer network in Education.
9. List the disadvantages associated in teaching and learning of computer networking.
10. Explain the protocols, procedures and functional organizations in teaching computer networking.

Learning Outcome

On completion of this course, students should be able to;

1. Define the two (2) computer networking.
2. List at least four (4) steps involved in teaching and learning computer networking.
3. Describe three (3) topology in teaching and learning computer networking.
4. List two (2) geographical span in teaching computer networking.
5. Describe five (5) advantages of students in teaching computer networking.
6. Explain at least two (2) components needed in teaching computer networking.
7. Explain four (4) examples of computer networking.
8. Describe five (5) basic concepts of computer networking in Education.
9. List at least two (2) disadvantages associated in teaching and learning computer networking.
10. Explain three (3) protocols, procedures and functions involved in teaching computer networking.

COURSE CONTENTS:

Protocols layers and service models. OSI and Internal protocols. What is the internet. Concepts of delay. Security and quality of service (QOS). Application layer protocols. Client server model. Sockets programming in client server. Web server programs. Reliable data transfer. Stop and Go evaluation. Principles of congestion control. Security overview of threats. Cryptography. Authentication and firewalls. Principles of routine. Link state and distance vector routine. Multiple access protocol.

MINIMUM ACADEMIC STANDARD

- Well-equipped computer laboratory.
- Personal computers.
- Other NUC and MAS requirements.

GOUNI- SCE 422: Hardware Security and Digital Forensics Methodologies (2 Units; Compulsory; LH = 15; PH = 45)

Senate-Approved Relevance

The importance of hardware security and digital forensics in our educational sector is an extremely important one that cannot be overemphasized, particularly with the various disturbing news of students and teachers kidnapping. There is an increasing need for security systems and law enforcement/emergency respondents tailored to preventing or responding to school and educational institutions-based violence. The absence of particular attention to this not only puts the students and traders at great risk but it also a threat to national unity and economic growth. This is in accordance with the vision of Godfrey Okoye University as a center of academic excellence and in congruence with the Sustainable Development Goals 2 for the year 2063.

Overview

Hardware software and digital forensics is a branch of science that focuses on identifying, acquiring, processing, analysis and reporting of data stored electronically.

The course exposes students to the purpose, methods and types of hardware security measures. It also takes students through the process of analyzing and documenting digital evidence. Teaching this course will also produce expert teachers in forensic investigation which is a great need in higher education institutions in Nigeria.

Objectives

The Objectives of the Course are:

1. Explain hardware security.
2. Describe steps involved in teaching hardware security.
3. List classes of hardware security and its learning outcome.
4. Define education digital forensics.
5. Describe the electrical and electromagnetic threat associated in learning hardware security.
6. List problems associated in teaching and learning personal computer security.
7. Define the staged involved in teaching temper resistant seals.
8. Describe open source and commercial source methodologies.
9. Analyze hardware procedures in teaching hardware security
10. List small and large capacity drives in learning hardware security.

Learning Outcomes

On completion of the course, students should be able to:

1. Explain at least 2 steps involved in teaching hardware security.
2. Describe three (3) hardware security environment.
3. List five (5) classes of hardware security and its learning outcome.
4. Define four (4) education digital forensics.
5. Describe at least two (2) electrical and electromagnetic threats in learning hardware security.
6. List two (2) stages involved in teaching temper-resistant seal.
7. Describe two (2) open source and commercial source methodologies.
8. Analyze one (1) hardware procedure in teaching hardware security.
9. List four (4) small and large capacity drives in learning hardware security.

Course Content

Definition of hardware security. Importance of hardware security. Hardware security environment. Electronically and electromagnetic threat information. Tapping technologies. Personal computer security. Tempest resistant seals. using open source/commercial software tools for digital forensics. Class drone analysis. Visualization techniques in digital media exploitation. Analyzing hardware imagery. Forensics investigation. Small digital devices. Large capacity drives. Software forensics. Tapping and open-source resolution. Electromagnetic environment. tapping digital devices.

Minimum Academic Standard

- Computer Laboratory
- Personal Computer

Other NUC – MAS requirements.

GOU- SCE 441: Instructional Software Development and Methodologies in Education (2 Units; compulsory; LH = 15; PH = 45)

Senate-Approved Relevance

Technology is increasingly moving to influence our lives. This is because most of the activities in school are being conducted through technology. In a world mediated by technology that has become an integral part of daily life, students are learning, working and having fun together. They prefer to use tablets, phones and computers rather than traditional communication. Today, students take advantage of technology for entertainment, communication and learning. In this period, students must have technology rich learning environment in schools as it helps teachers to embody information to create enriched and collaborative learning environment. This is in accordance with the vision of Godfrey Okoye University as a center of academic excellence and in congruence with the Sustainable Development Goals 2 for the year 2063.

Overview

Instructional Software Development is the theory of the design which uses expertise in tools, crafts and systems or methods of institutional organization to come up with solutions to problems.

Organizations, companies or groups, in providing education or training to do its member or staff, can use technology, in classroom, instruction, training in the workplace and professional field as well as in distance learning environment. Students on this course will be exposed to software tools, development and implementation.

OBJECTIVES:

The Objectives of the Course are:

1. Define instructional software development.
2. List importance of software development in teaching and learning.
3. Describe software development project in education.
4. List some of the cycles associated in teaching software development.
5. Define project management methodology.
6. List the requirements needed in teaching software evaluation.
7. Describe the methodologies associated in documentation of products.
8. List the cycles needed in teaching software project.
9. Describe software development standard and its leaning outcome.
10. Define parallel software methodologies.

Learning Outcomes

By the end of the lesson, students should be able to:

1. Define two (2) instructional software development
2. List at three (3) importance of software development in teaching and learning
3. Describe three (3) software development project in education
4. List four (4) cycles in teaching software development
5. Define at least two (2) project management
6. List five (5) requirements needed in teaching software evaluation
7. Describe two (2) methodologies associated in documentation of products
8. List six (6) cycles needed in teaching software project.

9. Describe at least five (5) software standard and its learning outcome.
10. Define two (2) parallel software terms.

Course Contents
Software development life cycle. Characteristics of instructional development cycle. Standard for instructional software. Benefits of software analysis planning. Software structured development project. Merits of instructional software development cycle. Demerits of software analysis. Data structures for instructional software. Employing software project. Software tools. Implementation of software development. Documentation of instructional software products. Software goals. Development goal project analysis. Planning and its development planning of instructional software. Target needed in software products. Architectures in system software.

Minimum Academic Standard
1. Well-equipped computer laboratory
2. Personal computer
3. Other relevant NUC – MAS requirements

Minimum Academic Standards Segments

List of equipment

Laboratory infrastructure: the space should be sufficiently large and must have a store.
A Computer Science programme should have at least three categories of laboratories: Software, network and digital logic laboratories. Best practice requires a staff to student's ratio of about 1 to 25 for laboratory practical. Therefore, multiple small laboratories are preferable to few large ones. Courses with large enrolments should have the students partitioned into groups to ensure each student has computer/practice equipment to themselves during practical sessions. Laboratory sessions should be conducted by staff to ensure close monitoring and effective achievement of learning outcomes.

Software laboratories
There should be an adequate number of software laboratories that can support the best practice staff to student ratio for all lab-based courses in the program. Software laboratories support programming courses and other courses requiring use of software tools. Requirements for the software laboratories include:

1. Computer systems with capacity to run software systems for all lab-based courses (such as, Intel based desktop PC with minimum of 166MHz or faster processor with at least 64 MB RAM and 100 MB free disk space.)
2. Programming environment and tools (such as, Compilers/interpreters and debuggers for Java, Python, compiler compilers, such as, flex, yacc and SableCC);

3. Operating systems environments and tools (such as, Windows, LINUX, TempOS, Nachos, Xinu or MiniOS)
4. Tools for systems analysis and design (such like, Unified Modelling Language (UML))
5. Computer maintenance tools like dust blowers,
6. Overhead projector
7. Power backup

Network laboratory

A separate network laboratory is required to expose students to practice on net-centric courses. Requirements for the network laboratory include:

a. 1.Routers, Switches, Radio modems and others.
b. 3.Dialup modems and PABXS
c. 4.Patch panels
d. 5.Simulation software like: Packet tracer, NS Simulator or others
e. 6.LAN testers, crimping tools and others.
f. 7.Practical consumables (RJ-45 connectors, twisted pair cable and other.

Digital logic laboratory

The digital logic or hardware laboratory should provide facilities required for hardware-related practical. Requirements for the digital logic laboratory include:

1.NAND, NOR, XOR, AND, OR gates
2.Multiplexers
3.Master-slave flip-flops
4.Digi-Designer Logic Board and others.
5.Dual–trace oscilloscope
6.Digital Proto-Board
7.Media Laboratory Lecture and ICT Training
8.Demonstration Laboratory Educational Technology and Micro – Teaching
9.Flat Screen television monitor
10.Media projector with wide screen

1. Video recorder with tripod stand
2. Software packages CAI, Photo shop, Recorded Audio and Video – visual resources
3. Sets of computer with necessary software
4. Blank CDs
5. 600dpi laser postscript printer
6. Media grade inkjet printer
7. Medium grade scanner

Staffing

The minimum standard for academic and non-academic staff must be met before starting a Computer Science Education programme as explained below.

Academic Staff

A minimum of five (5) Academic staff core to the subject areas are required.
The ratio of Academic staff to students shall be 1:15.
The staff structure for the academic staff is expected to be 20:35:45 for Professors/Readers: Senior Lecturers: Lecturers 1 and below respectively.

Non-Academic Staff

Ratio of Senior Technical Staff to Academic Staff shall be 1:10
Ratio of Junior Technical Staff to Academic Staff shall be 1:5
Ratio of Junior Admin Staff to Academic staff shall be 1:1
Ratio of Senior Admin Staff to Academic Staff shall be 1:10
Table 1 shows the categories of academic staff and their qualification requirements.

TABLE 1: Categories of Academic Staff

1. Professor
2. Associate Professor
3. Senior Lecturer
4. Lecturer
5. Assistant Lecturer
6. Graduate Assistant

Library

Universities should leverage available technology to put in place rich databases and other electronic/digital libraries and information resources. In addition, well stock and current hardcopies of reference and other textual materials should be provided centrally at the level of the Faculty. A well network digital library should serve the entire university community. Availability of wireless facilities (Wi Fi) with adequate bandwidth should enhance access to these electronic resources.
In any case, there should be internet ready workstations available in the library for at least 25% of the total student enrolled in each academic programme. The funding of the Library should be in line with NUC guidelines.

Classrooms, Laboratories, Workshops, Studios and Offices The NUC recommends the following physical space requirement: a. Professor's Office - 18.50

b. Head of Department's Office - 18.50
c. Tutorial Teaching Staff's Office - 13.50
d. Other Teaching Staff Space - 7.00
e. Technical Staff Space - 7.00

f. Secretarial Space - 7.00
g. Seminar Space/per student - 1.85
h. Laboratory Space per FTE - 7.50
i. Conference Room - 37.0

Effort must be made to provide the Department with at least:

1. At least two lecture rooms capable of sitting at least sixty students at the specification of 1 m^2 per FTE.
2. A Departmental conference room.
3. A staff common room.