

**DEPARTMENT OF COMPUTER SCIENCE,
FACULTY OF PHYSICAL SCIENCES,
AMBROSE ALLI UNIVERSITY, EKPOMA**

HANDBOOK

FORWARD

The Department of Computer Science is one of the most viable departments in the faculty of physical sciences. It took off in 1998 following the splitting of the then Department of Mathematics into two.

This maiden edition of the department of computer science contains the current and up-to-date information of the curriculum for the degree programme in line with NUC Minimum of Academic Standard. The philosophy, objectives, admission requirements of the Department are well packaged in this departmental handbook. The course guidelines in the course system with the description of the various courses are well specified.

The lists of academic, non-academic and technical staff are indicated. It is hoped that students will find the information it contains herein a useful guide throughout their period of studies.

I wish you a happy stay in the department.

Prof. I.B.A. Momodu

Head of Department

HISTORY OF THE DEPARTMENT

The Department of Computer Science was established in 1998 with Dr. F.M. Okoro, a Senior Lecturer as the Head of Department following the splitting of Department of Mathematics into 2 departments:

- Department of Mathematics
- Department of Computer Science and Statistics

In the 1997/1998 session, the intake was about 80 students. Since then, the student population has been rising gradually.

Our staff strength has been growing gradually from its beginning. At present we have the following full-time staff.

Four (4) Professors

Three (3) Senior Lecturers

One (1) Lecturer I

One (1) Lecturer II

Two (2) Assistant Lecturers

Six (6) Associate Lecturers

ACADEMIC STAFF

S/No	Name	Qualification	Salary	Designation
1	I.B.A Momodu	B.Sc. (Ekpoma) 1992, M.Sc. (Ekpoma) 1997 PGDCS (Benin) 2000, Ph.D. (Ekpoma) 2006 M.Sc. (NOUN) 2020	07/08	Professor/HOD
2	F.O. Ikpotokin	B.Sc. (Ekpoma) 1986, M.Sc. (Benin) 1991 Ph.D. (Benin) 1999	07/10	Professor
3	C.U. Onianwa	B.Sc. (Benin) 1984, M.Sc. (Benin) 1989 M.B.A. (Benin) 1994, Ph.D. (Ekpoma) 2007	07/04	Professor
4	S.E. Nnebe	B.Sc. (UNN) 1996, M.Sc. (Awka) 2002 M.B.A. (Ekpoma) 2001, Ph.D. (Ebonyi) 2011	07/03	Professor
5	R.E. Imhanlahimi	B.Ed. (Benin) 1985, PGDCS (Benin) 1995 M.Sc. (Benin) 2006, Ph.D. (Benin) 2015	05/02	Senior Lecturer
6	E.O. Oshoiribhor	B.Sc. (Benin) 1994, M.Sc. (Benin) 2004 Ph.D. (Ekpoma) 2016	05/02	Senior Lecturer
7	F.I. Sadiq	B.Tech. (Minna) 1998, M.B.A. (Ekpoma) 2004 M.Tech. (Akure) 2002, PGDE (Ekpoma) 2010 MPhil (Uniben) 2012 Ph.D. (Malaysia) 2019	05/01	Senior Lecturer
8	P.A. Aliga	B.Tech. (FUTO) 1997, M.Sc. (Awka) 2002	04/07	Lecturer I
9	M.I. Omogbhemhe	B.Sc. (Ekpoma) 2010, M.Sc. (Ekpoma) 2014 Ph.D. (Ekpoma) 2017	03/05	Lecturer II
10	N.A. Okoh	B.Sc. (Ekpoma) 2004, M.Sc. (Awka) 2016	02/08	Assistant Lecturer
11	I. Iyafokhai	B.Sc. (Ekpoma) 1998, M.Sc. (NOUN) 2014	02/06	Assistant Lecturer

LIST OF ASSOCIATE LECTURERS

1.	Prof. Agbeboh	Professor
2.	Prof. I. Aigbedion	Professor
3.	Prof. .O. Ujuanbi	Professor
4.	Prof. Jegede	Professor
5.	Prof. I.O Asia	Professor
6.	Prof. C.E. Abhulimen	Professor

TECHNICAL STAFF

Name of Staff	Rank/Designation Salary scale and Date of First Appointment	Qualification and Dates Obtained	Post qualification Work Experience	Remarks
Mr. Ikpotokin I.	Sys. Programmer II/Sys. Analyst II	B.Sc. (Ekpoma) 2004	10 yrs	
Mr. Emuan Osagie Thomson	Laboratory Technologist II CONUATSS 07/03		10 yrs	

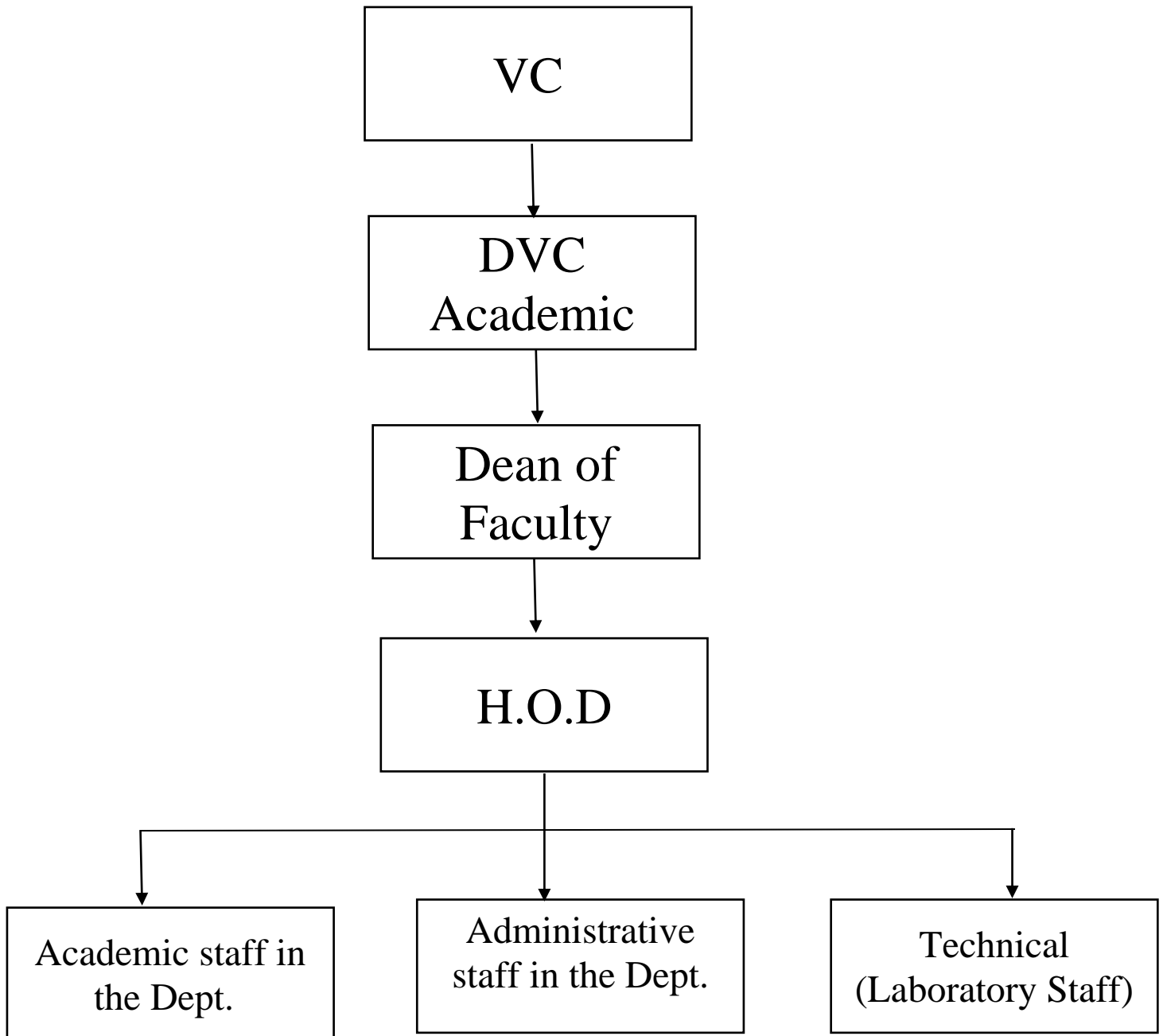
NON ACADEMIC STAFF

Name of Staff	Rank/Designation Salary scale and Date of First Appointment	Qualification and Dates Obtained	Post qualification Work Experience	Remarks
Mrs. Aimioshor	7/3 Senior Executive Officer. April 2009	B.Sc. Business Administration	Senior Executive Officer	
Elizabeth Ogidan	Messenger/Cleaner CONUNASS 1/6	FLSC 2011	Messenger/Cleaner	

ADMINISTRATION IN GENERAL OF PROGRAMME/SUB-DISCIPLINE/DISCIPLINE

Personal Administration

(a) Organization Structure (Use chart if necessary)



STAFF INVOLVEMENT IN ADMINISTRATION

Members of the academic staff are all member of the faculty board that handle matters relating to the administration of academic matters. Members are either chairman or members of various faculty board committees. The department is also run on committee system with various committees handling their respective matters. We have the following committees in the department

- (i) Examination Committee
- (ii) Admission Committee
- (iii) Curriculum Committee
- (iv) Examination malpractices Committee
- (v) Time table Committee
- (vi) Seminar Committee
- (vii) Staff welfare Committee
- (viii) Laboratory Committee
- (ix) Postgraduate Committee

The HOD and lecturers often have Board of studies meeting. The HOD also holds meeting with non-teaching staff from time to time.

ACADEMIC ATMOSPHERE

In pursuit of academic standards, students of the department are encouraged to undertake tours to different industries, private and government establishment that

are relevant to the learning and practice of computer science. Students embark on their Industrial Training (IT) after the 1st semester of 300 level and at the 1st semester of 400 level they are engaged in Seminar presentation in areas of current trends and advances in Computer Science and ICT. The seminar could also be on their IT experience. At the end of the 2nd Semester of 400 level, the students are encouraged to defend their project report in presence of the external examiner. Lecturers are also expected to give a seminar in their area of research interest once in a session.

ACADEMIC CONTENT

Existing curriculum of the programme

a) DEGREE PROGRAMME

The department of computer science offers a degree programme leading to the award of Bachelor of Science (B.Sc.) degree in Computer Science

b) PHILOSOPHY

The advent of modern Computers had transformed the entire society in the way we think, live and interact. The chronic and severe shortage of skilled Computer Scientist is well known. It is against this background that the degree programme is geared towards the indebt acquisition of skills that are relevant in Industry and Multi-national organizations. Consequently, the training in Computer Science is designed to cover all aspects of modern

computing techniques and its application the diverse fields of human endeavours.

c) OBJECTIVES

- i. To train middle level manpower in Computer Science and hardware/Software personnel that will be of service to the society.
- ii. To provide consultancy services to persons and/or bodies within and outside the University. These services includes among others:
 - a. Staff research guidance, design and analysis
 - b. Feasibility studies, survey, etc. on computer and data related matters for the University, private and public organization which will be beneficial to the society.
 - c. System study, design, development and maintenance of various Section of the University and /or carry out such study and design for individuals, private and public concern in the society.
 - d. Provision of guidance on specific IT projects
 - e. Design and analysis of program
 - f. Provide services to other Department in the teaching of Computer Science and IT related courses.

The department may also design courses that will be geared towards providing the much-needed technical and professional staff, who are non-graduates in Computer

Science. These Calibers of professionals are required in the industries, Banks, Computer Institutions and other government establishment.

Admission Requirements

a. UME

Candidates have WASC/GCE 'O' level or SSCE, NECO, NABTEB with credit passes in at least five subjects including English Language, Mathematics, Chemistry, Biology/Agric, Geography, Statistics, Economics and Government at not more than two sittings

b. DIRECT ENTRY

Candidate must satisfy UME requirement and any of the following:

- i. At least two GCE 'A' level passes which must include Mathematics and Physics
- ii. At least a credit grade in Diploma in any of the following: Data processing, Mathematics, Statistics, Computer Engineering and Computer Science from any recognized tertiary institution.
- iii. At least merit grade in National Certificate of Education in Mathematics, Computer Science, Statistics and Physics.
- iv. A good first degree in related area from a recognized University.

COURSE DISTRIBUTION

100 LEVEL

FIRST SEMESTER

Course Code	Title of Course	Units	Status
CSC 101	Introduction to Computer Science	2	C
STA 101	Statistics for Physical Science & Engineering	3	R
MTH 101	Algebra & Trigonometry	3	C
PHY 101	General Physics (Mechanics)	3	R
PHY 102	General Physics (Electricity & Magnetism)	3	R
GST 101	Use of English & Library Studies	4	C
GST 102	Philosophy and Logic	2	C
CHM 101	General Chemistry I	3	R
	SUB TOTAL	23	

SECOND SEMESTER

Course Code	Title of Course	Units	Status
CSC 111	Introduction to Computing	3	C
CSC 112	Introduction to Problem Solving (VBASIC)	3	C
MTH 111	Vectors & Co-ordinate geometry	3	C
MTH 112	Calculus	3	C
BIO 111	General Biology II	3	R
PHY 111	General Physics (Heat & Kinetic)	2	R

GST 111	Nigerian People & Culture	2	C
GST 112	History & Philosophy of Science	2	C
	SUB TOTAL	21	
	GRAND TOTAL	44	

**200 LEVEL
FIRST SEMESTER**

Course Code	Title of Course	Units	Status
CSC 201	Web Development	3	C
CSC 202	File Organization	3	C
CSC 203	Computer Programming 1 (JAVA)	3	C
CSC 204	Object Oriented Programming	2	C
CSC 205	Computer Hardware	3	C
MTH 201	Mathematical Methods	3	R
MTH 205	Elementary Differential Equations	3	R
	SUB TOTAL	20	

SECOND SEMESTER

Course Code	Title of Course	Units	Status
CSC 211	Data Structures & Algorithms	3	C
CSC 212	Information Processing	3	C

CSC 213	Assembly Language Programming	3	C
CSC 214	Numerical Methods I	3	C
CSC 215	Computer Programming II (PYTHON)	2	C
CSC 216	Introduction to Simulation Methods	3	C
GST 222	Peace And Conflict Resolution Studies	2	C
	SUB TOTAL	19	
	GRAND TOTAL	39	

**300 LEVEL
FIRST SEMESTER**

Course Code	Title of Course	Units	Status
CSC 301	Introduction to Digital Design	3	C
CSC 302	Operating Systems	3	C
CSC 303	Computer Architecture	3	C
CSC 304	Automata Theory, Computability & Formal Languages.	3	C
CSC 305	Artificial Intelligence (AI)	3	C
CSC 306	System Analysis and Design	3	C
CSC 307	Compiler Construction	3	C
CSC 308	Introduction to Operations Research	3	C

CSC 309	Discrete Mathematics	3	C
	SUB TOTAL	27	

SECOND SEMESTER

Course Code	Title of Course	Units	Status
CSC 399	Students Industrial Work Experience (SIWES)	15	C
	SUB UNIT	15	
	GRAND TOTAL	42	

ELECTIVE

Course Code	Title of Course	Units	Status
CSC 316	Optimization Theory	3	
CSC 317	Research Methods in Science	3	
CSC 318	Business Processing System	3	
CSC 321	Fundamental of Digital Electronics	3	
CSC 322	Introduction to Logic/Circuit Design	3	
CSC 323	Introduction to Communication	3	
CSC 331	File Structure for on-line System	3	
CSC 332	Computer Control System	3	

**400 LEVEL
FIRST SEMESTER**

Course Code	Title of Course	Units	Status
CSC 401	Organization of Programming Language	3	C
CSC 402	Software Engineering	3	C
CSC 403	System Modeling and Simulation	3	C
CSC 404	Real Time Computing	3	C
CSC 405	Computer Graphics	3	C
CSC 406	Seminar	3	C
CSC 407	Design and Analysis of Algorithms	3	C
CSC 408	Numerical Methods	3	C
	SUB TOTAL	23	

SECOND SEMESTER

Course Code	Title of Course	Units	Status
CSC 411	Project	6	C
CSC 412	Computer Performance Evaluation	3	C

CSC 413	Data Communication and Networking	3	R
CSC 414	Database Management System (DBMS)	3	C
CSC 415	Computer Installation and Management	3	C
	SUB TOTAL	18	
	GRAND TOTAL	41	

ELECTIVE

Course Code	Title of Course	Units	Status
CSC 416	Distributed Computing	3	E
CSC 417	Experts Systems	3	E
CSC 418	Microprocessor in Auto mailing System	2	E
CSC 419	Software Reliability	3	E
CSC 420	Digital Computing Technique	3	E
CSC 421	Distributed Computer Control	3	E
CSC 422	System Reliability & Maintenance	3	E
CSC 423	Computer Based Management Techniques	3	E

COURSES DESCRIPTION

CSC 101 INTRODUCTION TO COMPUTER SCIENCE (2Units)

History of Computer, functional components computer, characteristics of a computer, data representation (Number systems and character representation). Basic computer algorithm, pseudocodes, flow-charts. Introduction to inform technology, introduction to BASIC programming languages, overview of computer applications.

CSC 111 INTRODUCTION TO APPLICATION PACKAGES (3UNITS)

Line spacing and merging, formatting text, importing text and exporting information, Graphics effect. Editing graphics versus working with templates, information storage, sorting and retrieval, making customized records validating records entries. Creating forms and control, creating performing and saving queries. The sue of MS-word and Dbase IV or Paradox or FoxPro or Oracle 10g

CSC 112 INTRODUCTION TO PROBLEM SOLVING (VISUAL BASIC) (3UNITS)

Problem Solving strategies, Role of Algorithm in problem solving process, implementation strategies, concepts and properties of algorithms, solving of small-scale problems and implementation of programs in a widely used programming

language should be used in teaching above. Laboratory exercises in the chosen programming language.

CSC 201 WEB DEVELOPMENT (3UNITS)

Introduction to the WWW, HTML-document structure images, links maps, tables, forms protocols and server technology – HTTP, TCP/IP, MIME, URLs, CGI, JavaScript Syntax, Dom, forms processing, common tasks style sheet-fundamentals, CSS formatting, CSS positioning, web design and usability, introduction to XML-syntax, DTDs XSL, XHTML, Multimedia; audio, video animation, multimedia server and protocol technology, web development tools-Editors, site management tools.

CSC 202 FILE ORGANIZATION (3UNITS)

Concept of data records and files. Record format and labels; physical files, cards and paper – tape based characteristics of 3 major file types; punched card, magnetic tape and direct access files, logical files, definition, label (header and trailer) record blocking and deblocking, inter-record gaps. Basic methods of file processing, sequential, index-sequential and random. Concept related to on-line and off-line, physical and logical records, channels, direct memory access, cycle stealing, direct access device and control units, cylinders, tracks format, seeks, search time, Essential consideration for efficient method of file organization,

specific consideration for batch and multi-access system inverted files, overflow and chaining.

CSC 203 COMPUTER PROGRAMMING 1 (JAVA) (3UNITS)

Introduction to the problem solving methods and algorithms development, designing, coding, debugging and documenting programs using techniques of good programming language style, computer organization, programming language and programming algorithm development. A wisely used programming language should be used in the teaching above. Pre-requisite – CSC 101

CSC 204 OBJECT ORIENTED PROGRAMMING I (3 UNITS)

Concept of OOP, comparison with structured programming language classes, inheritance, encapsulation, polymorphism, data hiding, problem solving skills. A widely used OOP language, should be used in teaching the above i.e. C++, Small talk, Java etc.

CSC 203 JAVA PROGRAMMING

This course introduces computer programming using the Visual BASIC programming language with object-oriented programming principles, Emphasis is on event-driven programming methods, including creating and manipulating object, classes, and using object-oriented tools such as the class debugger.

CSC 205 COMPUTER HARDWARE (3UNITS)

Computer circuits, diode arrays, PIA's etc. integrated circuits fabrication processing. Use of MSI, LSI, and VLSI IC hardware design. Peripheral and secondary memories; core memory, etc. magnetic devices, disks, tapes, video disks etc. peripheral devices, printers, CRT'S keyboard, character recognition, operation amplifiers, analogue to digital and digital to analogue converter. Analogue computers.

CSC211 DATA STRUCTURE AND ALGORITHMS (3 UNITS)

Algorithm and flow charts, arrays, stacks, queues, linked list, sparse matrices and deques, algorithms for sorting and searching. Bits, Bytes, word, linear structures, arrays tree structures, sets and relations; high level data handling facilities.

CSC212 INFORMATION PROCESSING (3 UNITS)

Information system, time sharing, system management, information system, selective information by conditional branch processes, trade – off between selective and speed information overflow to file organization, data structure, sorting, and merging. Construction and maintenance of search trees, decision tables. Sorting and searching. Quick sort and binary search, variation on Quick sort, Heap sort address, Calculation sorting, balanced merger, cascade lumphase and Oscillating merger sorts including read backward operation and tape remind times, Disks sorting, Keysorts, work file organization. The balanced merged and crisis – cross, merged sort, Optimum merging network, decision tables, conversion of

decision tables to program network, rule mark and other techniques. Data compression techniques to reduces the amount of space needed to store program and data file, database as a tool for information processing.

CSC 213 ASSEMBLY LANGUAGE PROGRAMMING (3 UNITS)

Computer structure, machine language, assembly language, addressing techniques, macros, file I/O, assembler directives and linkage, assembler construction, interpretative fortunes. Binary integer arithmetic, assembly language format, register-to-register, instruction, input/output, RWD and WWD, program structure and documentation. Information units, RS instruction. The assembler output, Symbolic names in Assembly languages. Memory reference, instruction address, RX instruction, indexed address, half word operation address, RX instruction. Memory address, RX instruction formats. The LA instruction, loop control character, input/output RCD. Program testing, the art of debugging, sub-routine, linkage, bit manipulation, decimal arithmetic, floating point arithmetic. Macro programming and control of the assembler.

CSC 214 NUMERICAL METHODS (3UNITS)

Vector space over the real field, Linear independence, basic and dimension, Linear transformation ad their representation by matrices. Algebra of matrices, systems of linear equation. Solution of algebraic and transcendental equation. Use of high language in the solution of algebraic and transcendental equation, curve fitting,

error analysis, interpolation and approximation, zeros of non-linear equation in one variable, numerical differentiation and integration, programming language should be used in teaching the above numerical methods.

CSC 215 COMPUTER PROGRAMMING II (PYTHON) (2UNIT)

Principles of good programming structural programming concepts, debugging and testing, processing, internal searching and sorting, data structures, recursions using programming languages. Pre-requisite: CSC 203

CSC 216 INTRODUCTION TO SIMULATION METHODS (3UNITS)

Types of simulation, analogue, continuous and discrete model. Event-type or Discrete Simulation. Random phenomenon in simulation; generation of random deviation and generation of random numbers. Statistical Analysis in Simulation. Transient and Steady State conditions, gathering Observations in Simulation. The use of FORTRAN for Computer Simulation Studies, Standard frequency distribution and other simulation languages.

CSC 301 INTRODUCTION TO DIGITAL DESIGN (3UNITS)

Combinatorial logic, sequential logic, microprocessors and microcomputers.

CSC 302 OPERATION SYSTEMS (3UNITS)

Introduction to computer processes, multiprogramming and multiprocessing system. Issues in analyzing and designing operating system, memory management, protection resources allocation.

CSC 303 COMPUTER ARCHITECTURE (3UNITS)

Basic logic design, data representation, instruction formats, computer architecture, study architecture of an actual simple mini-computer. Memory system general characteristics of conduction memory, charged couple devices, magnetic bubble. Memory addressing, memory hierarchy, virtual Memory control system. Hardware control, micro-programmed control, asynchronous control, I/O control.

CSC 304 AUTOMATA THEORY, COMPUTABILITY AND FORMAL LANGUAGES (3UNITS)

Formal programmers and automata's, regular language, context free languages, deterministic passing of context-free languages, recursive languages.

CSC 305 ARTIFICAIL INTELLIGENCE (3 UNITS)

Introduction to system design and analysis tool, determining system alternatives, physical design of computer sub-system, physical design of manual sub-system, special design features.

306 SYSTEM ANALYSIS AND DESIGN (3 UNIT)

Introduction to system design and analysis tool, determining system alternatives, physical design of computer sub-system, physical design of manual sub-system, special design features.

307 COMPILER CONSTRUCTION (3UNIT)

Review of compilers, assemblers and interpreters structure and functional aspects of typical compiler, syntax, semantics and pragmatics, functions relationship between lexical analysis, syntax analysis, expression analysis and generation, internal form of course program, use of a standard compiler (FORTRAN, COBOL or POL/1) as a working vehicles, errors detection and recovery grammars and languages, the parsing problem

CSC308 INTRODUCTION TO OPERATIONS RESEARCH (3 UNITS)

The origins, nature and impact of operations research study. Phrases of an operation research study. Mathematical programming, the linear programming (LP) formulation and the underlying assumption, Graphical solution of 2-variable LP's The geometry n-variable Lp's polytype convexity and extreme points. The use of a high level language in the solution process of the simplex techniques. Simplex Big-M, artificial, Dual, Revised simplex methods. Interior-point method. The transportation problems, assignment problem, Decision theory models, inventory models.

CSC 309 DISCRETE MATHEMATICS (3UNITS)

Graph theory, undirected and directed graphs, partition and distance planar and non-planar graphs, matrix representation, application from network flow LP and PERT, CPM, switching networks, shortest path, algebras, algorithms monoids and machines lattice and Boolean algebra groups, combinations, logic and languages.

CSC 310 DATA MANAGERMENTS 1: (2UNITS)

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.

CSC 314 COMPUTATIONAL SCIENCE AND NUMERICAL METHODS

operations research, numerical computation, graphical computation, modeling and simulation, high performance computation

CSC 315 SURVEY OF PROGRAMMING LANGUAGES (4UNITS)

Overview of programming languages: History of programming languages, Brief survey of programming paradigms (Procedural languages, Object-oriented languages, Functional languages, Declarative – non-algorithmic languages, Scripting languages), the effects of scale on programming methodology; Language Description: Syntactic structure (Expression notations, abstract Syntax Tree, Lexical syntax, Grammars for Expressions, Variants of Grammars), Language semantics (Information semantics, Overview of formal semantics, Denotation semantics, Axiomatic semantics, Operational semantics); Declaration and types: The concept of types, Declaration models (binding, visibility, scope, and lifetime),

Overview of type-checking, Garbage collection; Abstraction mechanisms: Procedures, function and iterations as abstraction mechanisms, Parameterization mechanisms (reference vs. value), Activation records and storage management, Type parameters and parameterized types, Modules in programming languages; Object oriented language paradigm; Function and logic language paradigms.

CSC 399 INDUSTRIAL TRAINING EXPERIENCE (6UNINTS)

Sensitivity analysis, decomposition principles, integer programming, game theory, Non-linear programming, the Kuh-Tucker conditions, quadratic programming, the Kuh-Tucker condition, quadratic programming, convex programming, dynamic programming, stochastic programming multi-objective optimization.

CSC 317 RESEARCH METHODS IN SCIENCE (3UNITS)

Introduction – statistics necessary to conduct and evaluate research problem. Research topic formulation and definition. Information gathering techniques- Elementary sampling survey, questionnaire design etc. literature review. Data presentation and analysis. Drawing conclusion and making recommendation. Referencing/bibliography. Acknowledgement, project report design, Appendices. The use of computer in data analysis and report presentation. Seminar presentation, project/thesis defence. Note: students will be required to conduct a simple research within the university town to demonstrate the research skills acquired.

CSC 318 BUSINESS PROCESSING SYSTEM (3UNITS)

Discussion of algorithms for storage and retrieval of information. Introduction of organization, computer application in accounting, scheduling and inventory control. Report generation, billing.

CSC 321 FUNDAMENTAL OF DIGITAL ELECTRONICS (3UNITS)

Voltage and current sources: Kirchhoff's laws, linearity, and superposition, therein and Norton theorems; Steady-state response to sinusoidal excitation, impulse response semi-field effect transistor. Use of transistors as a switch in Schmitt triggers; multivibrators; NOR and NAND gates. Integrated circuits, classification of IC circuits as SSI, MSI, and LSI.

CSC 322 INTRODUCTION TO LOGIC/CIRCUIT DESIGN (3 UNITS)

Information representation and manipulation coding, functions, Boolean, Algebra, logic gates, combinational circuiting design, canonical forms, graphical and algorithmic methods of synthesis and minimization of combinational circuits, memories including latch, flip flop, shift register, RAM and ROM. Synthesis of synchronous sequential networks, asynchronous sequential logic.

CSC323 INTRODUCTION TO COMMUNICATION (3 UNITS)

Introduction, waves, Fourier analysis measure of communication, channel characteristics, transmission media, noise and distortion, modulation and demodulation, multiplexing TDM, FDM and FCM, parallel and serial transmission (Synchronous vs Asynchronous).

CSC 331 FILE STRUCTURE FOR ON-LINE SYSTEMS (3 UNITS)

File Structure, creation, access and modification with special emphasis on systems constraints in processing very large files. Requirements of on-online systems, on-online information retrieval.

CSC332 COMPUTER CONTROL SYSTEMS (3 UNITS)

Elements of control systems. A/D and D/A , sampling theorem, signal conditioning, anti-alias filters, sensors, actuators, feedback, feed forward, cascade and ration controls DDC. Control implementation with centralized and distribution computer systems. Architecture, communication, sequential control, case studies of distributed control systems and programmable controllers.

CSC 401 ORGANISATION OF PROGRAMMING LANGUAGES (3UNITS)

Language definition structure. Datatypes and structures, review of basic datatypes, including list and trees, control structure and data flow, run-time consideration, interpretation, languages, lexical analysis and parsing.

CSC 402 SOFTWARE ENGINEERING (3UNITS)

Introduction, softwareprocessing, project planning requirement engineering, system methods, process models, DFD's state-transitions, state charts, VML, Data models, ER models, Object oriented modeling using UML, software verification and validation, software testing. Standards, Structures, organization, project control

standards, project team standards, documentation implementation, project technical standards, project system manual.

CSC 403 SYSTEM MODELLING AND SIMULATION (3UNITS)

Formulating and implementing a simulation model; generating random observation from a probability distribution. Preparing a simulation program, validating the model. Application of simulation in queuing systems, the use of a suitable language or computer simulation.

CSC 404 REAL TIME COMPUTING

SIC machine architecture (review), Abstract machine design, Art of writing good assembly program for real time application (primitive routines macros, storage allocation, interrupt). Debugging program, hardware debugging, aids and remote computer debugging, debugging systems. Real time operating system. Basic intercommunication techniques. Example of real time applications language for real time application programming micro programmers.

CSC 405 COMPUTER GRAPHICS (3UNITS)

Hardware aspects, plotters, microfilm plotter displays, graphic tablets, light pens, and other graphical input aids-facsimile and its problems, refresh display, refresh buggers changing image, light pen interaction. Two and three dimensional transformations, perspective, clipping algorithms, hidden line removal. Warriok's Method, shading data reduction for graphical input, introduction to hard writing

and character recognition, curve synthesis and fitting, containing ring structure versus double linked lists. Hierarchical structures. Data structures and organization for interactive graphics.

CSC 406 SEMINAR (2UNITS)

Seminar topics chosen from a variety of computer areas including application in various fields, computer installation, staffing and administration, computer maintenance software engineering etc.

CSC 407 STRUCTURED PROGRAMMING AND ALGORITHMS (3UNITS)

Principles of good programming style, expression and documentation, standards refinement of both statement and data. Program modulation (bottom-up approach, top down approach, nested virtual machine approach), languages for structural programming, debugging, testing, verifying, code inspection, semantics analysis. Test construction, program verification, test generation and running strong processing data structure recursions, efficiency of algorithms.

CSC 408 NUMERICAL METHODS (3UNITS)

A review of subroutine packages, error analysis and forms, alternative methods, computation of eigenvalues and eigenvectors related topics. Numerical solution of non-linear systems of algorithms equations, least-square solution over determined systems.

CSC 409 NET-CENTRIC COMPUTING (3UNITS)

Distributed computing, mobile & wireless computing, network security; client/server computing (using the web), building web applications.

CSC 411 PROJECT (6UNITS)

CSC 412 COMPUTER PERFORMANCE EVALUATION (3UNITS)

Measurement techniques, simulation techniques, analysis techniques, workload characterization, performance evaluation in selection problems. Performance evaluation in design problems evaluation program performance.

CSC 413 DATA COMMUNICATION AND NETWORKING (3UNITS)

Introduction to wave, Fourier analysis, measure of communication channel characteristics transmission media, noise and distortion modulation and demodulation, multiplexing, TDM, FDM and FCM, parallel and serial transmission (synchronous vs. asynchronous). Bus structure and loop system, computer network. Examples are design consideration, data switching principles, broadcast technique network structure for packet switching, protocols description networks. E.G PANET, DSC Etc.

CSC 414 DATABASE MANAGEMENT (3UNITS)

Files, computation on a database, hierarchical view of data, Description, Binding, classification of operating system application. Database structure model, semantics

of relation operation on models, design of a data model, schema, protection, Database operation and management.

CSC 415 COMPUTER INSTALLATION AND MANAGEMENT (3UNITS)

The role of computer center, general operating procedures, data preparation. The magnetic tape library, operating procedure, job processing, security, procedure, performance statistics.

CSC 416 DISTRIBUTED COMPUTING (3UNITS)

Distributed systems. Distributed processing and the characteristics of distributed computer in general. Distributed data processing as a management technique and a problem solving tool. Advantages and problems associated with the adoption of the distributed approach in a developing country.

Operation consideration, human and equipment. Design consideration, strategic approach-feasible degree of recovering communication aspects, costing distributed system.

CSC 417 EXPERT SYSTEMS (3UNITS)

What are expert's systems. Basic concept for building expert systems, architecture of expert systems, construction of expert systems. Tools for building expert systems reasoning about reasoning evaluation of expert system. Languages and tools knowledge engineering.

CSC 418 MICROPROCESSOR IN AUTOMATING SYSTEM (3UNITS)

Microprocessor architecture, basic microprocessor concepts, timing and sequencing, memory and I/O synchronization, data transfer, arithmetic and logic operations, software development, assembler, source programs, assembler direction and pseudo instruction. Interrupt and DMA; interrupt structure, priority, FIFO buffers, DMA microprocessors interfaces, parallel and serial interfaces, digital/analog conversion I/O programming. Case studies of microprocessor based system in automation.

CSC 419 SOFTWARE RELIABILITY (3UNITS)

Concepts of software reliability. Basic design principles of reliable software. Requirement, objectives and specification, system architecture, program structure design. Design practices modules design and coding programming style. Testing principles, modules testing function and system testing. Debugging management techniques for reliability. Proving program correctness. Reliable models. Software support systems. Dynamics verification of operating systems. Database integrity.

CSC 420 DIGITAL COMPUTING TECHNIQUES (3UNITS)

Floating point computation. Numerical solution of O.D.E initial and boundary value problems. Stiffness, numerical solution of P.D.E. Finite differences, application to heat conditions, Laplace and wave equations. Introduction to finite

element methods. The use of numerical software in modelling and digital simulation.

CSC 421 DISTRIBUTED COMPUTED CONTROL (3UNITS)

Distributed control system configuration. Communication network. Operator interface station control algorithms in distributed control systems. Economic justification of distributed control evaluation of distributed control systems. Microcomputer control networks. Failure trends in distributed computer control.

CSC 422 SYSTEM RELIABILITY AND MAINTENANCE (3UNITS)

CSC 423 COMPUTER BASED MANAGEMENT TECHNIQUES (3UNITS)

Principles of intelligence measurement devices. Special purpose sensors, installation maintenance. Analytical instrumentation; gas chromatography; mass spectroscopy, infrared spectroscopy. Calibration, industrial measurements such as on-line analysis of process streams; weight; pH meters, engine monitoring and turning machine alignment; noise and vibration. Inferential measurement. Estimation of efficiency wears fouling creep.

WORKLOAD BY STUDENTS

Grouping	Course No/Level	Course/Subject	Pre-requisite	Contact/Hours/Week			Total work load
				Lecture	Tutorial	Practical	
(a) General courses, e.g. Humanities, Communication and Soc. Sciences	For example GST 101	Use Of English & Library Studies	NIL	4 hrs	2 hrs		
	GST 101	Philosophy & Logic	NIL	2 hrs	1 hrs		
	GST 111	Nigeria People Culture		2 hrs			
	GST 112	History & Philosophy of science		2 hrs			
	GST 222	Peace & conflict resolution					
(b) Core/Compulsory Courses	CSC 101	Info. to Computer Science	NIL	3 hrs	2 hrs		6 hrs
	STA 101	Statistics	NIL	4 hrs			
	MTH 101	Algebra & Trigonometry	NIL	3 hrs			
	PHY 101	Mechanics	NIL	3 hrs			
	PHY 102	Electricity & Magnetism	NIL	3 hrs			
	CSC 111		NIL	3 hrs	-		5 hrs
	MTH 111		NIL	3 hrs			
	MTH 112		NIL	3 hrs			
	MTH 113		NIL	3 hrs			
	PHY 111		NIL	2 hrs			
	PHY 103		NIL	2 hrs			
(c) Electives/Optional Courses	NIL						

Grouping	Course No/Level	No. of Students Taught	Courses/Subject	Pre-requisite	Staff Contact Hours			Weekly Contact Hour	
					Lecture	Tutorial	Practical		
100 L	CSC 101	1500	Intro. To computer science Intro. to Application packages Computer Electronics	NIL	2 hrs			6 hrs	
	CSC 111	78		NIL	-			5 hrs	
	CSC 112	78		NIL	-			6 hrs	
200 L	CSC 201	82	Web Development File Organization Computer	NIL	2 hrs			7 hrs	
	CSC 202	82		NIL	2 hrs			5 hrs	
	CSC 203	82		CSC 101	1 hrs			7 hrs	
	CSC 211	82	Data Structure and algorithm Information processing Assembly language programming Numerical Method I Computer programming II (Pascal) Peace and Conflict, Resolution studies Introduction to simulation methods	NIL	2 hrs			5 hrs	
	CSC 212	82		-	2 hrs			5 hrs	
	CSC 213	82		-	-	1 hrs		3 hrs	
	CSC 214	82		NIL	2 hrs			5 hrs	
	CSC 215	82		101/102	2 hrs			7 hrs	
	GST 222	82		CSC 203	-	2 hrs			2 hrs
	CSC 216	82		STA 101	3 hrs	2 hrs			

300 LEVEL

(a) CORE/Compulsory Courses	CSC 301 CSC 302 CSC 303 CSC 304 CSC 305 CSC 306 CSC 307 CSC 308 CSC 309	51 51 51 51 51 51 51 51 51	Intro. To digital design Operating systems Computer Architecture Automata theory, Computability & Formal language Artificial Intelligence (AI) Systems analysis and design Compiler construction Intro. To Operation research Discrete Mathematics	NIL	3hrs 3hrs 3hrs 3hrs 3hrs 3hrs 3hrs 3hrs 3hrs	2 hrs 1 hrs 1 hrs 2 hrs 1 hr 2 hrs 1 hr 2 hrs 2 hrs	- - - - - - - 1 hr - - -	1 hrs 4 hrs 4 hrs 5 hrs 4 hrs 5 hrs 5 hrs 5 hrs 5 hrs
	CSC 399	51			-	-	15 hrs	-
(b) Electives	CSC 316 CSC 317 CSC 323 CSC 331 CSC 332	51 51 51 51 51			3hrs 3hrs 3hrs 3hrs 3hrs 3hrs			

Grouping	Course No/Level	No. of Students Taught	Courses/Subject	Pre-requisite	Staff Contact Hours			Weekly Contact Hour
					Lecture	Tutorial	Practical	
(a) CORE/ Compulsory Courses	CSC 401	60	Organization of programming languages		3 hrs	2 hrs		5 hrs
	CSC 402	60	Software engineering		3 hrs	2 hrs		5 hrs
	CSC 403	60	System modeling and simulation		3 hrs	2 hrs	2 hrs	5 hrs
	CSC 404	60	Real-time programming		3 hrs	2 hrs		5 hrs
	CSC 405	60	Computer graphics		3 hrs	2 hrs		5 hrs
	CSC 406	60	Seminar		-	-		5 hrs
	CSC 407	60	Design and analysis of algorithm		3 hrs	2 hrs		2 hrs
	CSC 408	60	Numerical methods II		3 hrs	2 hrs		5 hrs
(b) Electives	CSC 411	60	Project		-	-	6 hrs	6 hrs
	CSC 412	60	Computer performance evaluation		3 hrs	2 hrs		5 hrs
	CSC 412	60	Database management system (DBMS)		3 hrs	2 hrs		5 hrs
	CSC 416	60	Computer installation management		3 hrs	2 hrs		5 hrs
	CSC 413	60	Data communication /networking		3 hrs	2 hrs		5 hrs
	CSC 409	60	Queuing theory		3 hrs			
	CSC 416	60	Distributed computing		3 hrs			
	CSC 417	60	Experts systems		3 hrs			
CSC 418	60	Microprocessor in auto mailing system		3 hrs				
CSC 419	60	Software reliability		3 hrs				
CSC 420	60	Digital computing techniques		3 hrs				
CSC 412	60	Distributed computer control		3 hrs				
CSC 422	60	System reliability and maintenance		3 hrs				
CSC 423	60	Computer based management technique		3 hrs				