MBMIST

MUHAMMADU BUHARI METEOROLOGICAL INSTITUTE OF SCIENCE AND TECHNOLOGY

Kastina, Nigeria

Safety, Innovation, Excellence

Programme Handbook
2023 – 2025

NiMet
Nigerian Meteorological Agency

WMO

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Overview of MBMIST

from the Chairman of Council

Welcome to the Muhammadu Buhari Meteorological Institute of Science and Technology (MBMIST), the premier technological tertiary institution for studying meteorological and climate change science related programmes located in the Arid Region of Nigeria. Founded in 2019 under the leadership of Senator Hadi Abubakar Sirika, the Honourable Minister of Aviation of the Federal Republic of Nigeria. It commenced academic activities in the 2020/2021 academic session with in-kind donation of a campus by the Katsina State Government through the Executive Governor, Rt. Hon. Aminu Bello Masari. The institution was commissioned on Thursday January 26, 2023, by Muhammadu Buhari, the President and Commander-in-Chief of the Armed Forces of Nigeria.

Socioeconomic activities and economies world-wide including those of Africa are now and will continue to be vulnerable to extreme weather conditions like floods, heat waves and other climatic disasters such as meteorological drought, forest fires, landslides, hurricanes, etc. Yet highly skilled technological manpower is still ridiculously scarce across Africa as well as in Nigeria. It is particularly critical in the fields of climate change mitigation and adaptation, climate and water diplomacy, meteorological observation technology, climate change science technology, electro meteorological engineering technology, etc. The scarcity of experts in these fields exist despite the daily growing threat posed by climate change to Africa. MBMIST was established to help trained middle and high level skilled technical manpower in the aforementioned and related fields.

An internationally welcoming environment for learning, social interaction and multiculturalism is something the institution is dedicated to offer to its students. In addition, to maintain the standards of the National Board for Technical Board (NBTE) of Nigeria. The resources for teaching, learning infrastructures, academic curriculum and operations are designed to meet with the standards of the World Meteorological Organization (WMO) and International Organization for Standardization (ISO).

MBMIST's purpose is to transform student's knowledge of weather and climate change science into a love of the subject. Give students the ability to create innovative solutions to combat climate menace, monitor weather and predict weather behaviour for different socioeconomic purposes. Also built in the long-term a community of meteorological and climate change science technologists across Western and Central Africa Regions, who can develop and use low-cost climate mitigation and adaptation technologies. This is in order to protect peoples' lives, their properties, food security, livelihood sources and development of their countries' economies in the face of growing negative global climate and local weather. Thus, the motto of MBMIST is "safety, innovation, excellence".

The Institution's Council is eager to support the management of MBMIST to help students become meteorological, climate change mitigation and adaptation solution thinkers. Also help them realise their full potential in the areas of professional competence, personal fulfilment and inculcate in them soft skills that fit them into the wider global community and get them to contribute to the larger global society.

Professor Mansur Bako Matazu

Chairman of MBMIST Council
Director-General, Nigerian Meteorological Agency (NiMet) and
Permanent Representative of Nigeria with World Meteorological Organization (WMO)

Message from the Rector of MBMIST

On behalf of the Management of MBMIST and the Academic Board, I warmly welcome you all to the premier institution of higher learning in the fields of meteorological science and climate change science. Your choice of MBMIST demonstrates that you have made a good choice and want to join the pool of regional-wide professionals who will drive Nigeria and Africa's transition to a low-carbon economy (Green Economy). Society considers you as mature because you are in a higher institution and MBMIST management expects that you will behave similarly as a student and good citizen of your country. This is by taking your studies seriously and participating in all classroom, field, laboratory and industry activities. According to the rules governing behaviours and discipline at MBMIST, management does not hesitate at any time to discipline a misbehaving student.

MBMIST has some of the top academics as well as a pool of WMO-certified Meteorologists and Climate Change Scientists. I am also pleased to inform you that the MBMIST Council has given its approval for the institution's programme to be expanded to include graduate level training and others. To this, Management will work with the National Board for Technical Education (NBTE) to start the:

a) Higher National Diploma (HND) in Meteorological Science;
b) Higher National Diploma (HND) Climate Change Science; and
c) National Diploma (ND) in Electro Meteorological Engineering Technology.

The MBMIST programme handbook has been prepared to inform you directly about the course/programme of study and provide academic guidance to students of the institution. The Chairman of Council gives an overview of the institution and why it was established. The handbook also provides information about the admission and examination requirements. How grades points averages are computed, what is the requirement to graduate and classification of MBMIST diploma certificates.

It is expected of you as a student to play your rightful role and always be a good ambassador of the institution. Make time to participate in extracurricular activities and develop leadership, critical thinking and interpersonal skills needed for your future. Enjoy your stay as a student by taking advantage of the myriad of facilities and resources on campus.

Best wishes and have a fulfilling and memorable time at MBMIST

Effiom Essien Oku, Ph.D

Charles Darwin Professor

Rector, Muhammadu Buhari Meteorological Institute of Science and Technology

Notes from the Registrar of MBMIST

On behalf of the entire community of Muhammadu Buhari Meteorological Institute of Science and Technology (MBMIST) Katsina, I welcome you all to MBMIST and WMO Climate Resource Centre. Gaining and accepting admission into the academic programmes of MBMIST translates into an undertaking that the rules and regulations of MBMIST would govern your entire academic pursuit, disposition, behaviour, and indeed your day-to-day social and academic conduct. It is therefore important and mandatory for you all to acquaint yourselves with the laws and regulations of the institution, especially those sections that deal with academic programmes and discipline of students.

The students are expected to exhibit good conduct and sound moral behaviour within and outside the institute. Any act of lawlessness, anti-social behaviour, cultism and others would not be tolerated. We expect from you resolved commitment, hard work and respect for the institutions' laws and regulations. Be decent, morally upright and academically dynamic.

It is also important to crave your indulgence in sharing the vision and mission of the institution so that you grow with it and make the vision an innate part of you. As the Chairman of the Council pointed out, the institute aimed to produce well-grounded and sound graduates equipped with problem-solving skills to combat climate menace, monitor and predict the weather in line with the demands of the 21st century. Produced students that can be self–employed, and whose skills and knowledge would accelerate development locally, regionally, nationally and globally.

Visit the library frequently and learn the basic operations of a computer if you are not computer literate. What the institution is expecting from you is to attain the minimum 75 % attendance for lectures and practicals and with good scores in all continuous assessments. The examination regulations of the institute are very explicit and clear. Hence, the institute will never tolerate any form of examination malpractice. I, therefore, congratulate you for your wonderful achievement by being part of the institute's academic project, whose foundation was laid on a solid commitment to research and educational development.

We must express our gratitude and appreciation to the President of the Federal Republic of Nigeria, President Muhammadu Buhari, The Hon. Minister of Aviation, Senator Hadi Sirika, the Government of Katsina State under the leadership of Rt. Hon. Aminu Bello Masari and Director-General of Nigerian Meteorological Agency (NiMet), Professor Mansur Bako Matazu for their commitment to the development and progress of the institution and indeed for their provision of quality technical education to the good people of Nigeria. You must do all within your power to guard these facilities provided against misuse or destruction.

Dr. Mukhtar Abubakar Balarabe

Registrar, Muhammadu Buhari Meteorological Institute of Science and Technology

Vision

To be one of the leading International Centre of Excellence for capacity development in Meteorology and climate Change Science.

Mission

To provide quality training and tailored research experience in meteorology, hydrological and climate related sciences for indigenous and international community of atmospheric scientists

Our Goals

MBMIST strive to achieve the following goals;

a) Strengthen academic excellence in accordance with market demands and both national and international standards;

b) Build a student-centred development model that will help students launch successful careers; and

c) Develop closer relationships with our host community and other external communities.

Our Objective

To provide training and retraining opportunities in meteorological and climate change sciences in line with World Meteorological Organization (WMO) and National Board for Technical Education (NBTE) guidelines.

Our Core Values/Motto

- **Safety:** At MBMIST safety is the watch-word. We understand taking safety for granted can mean taking a life.
- **Innovation:** MBMIST uphold creativity, creative thinking in order to find solutions to wicked problems of climate change.
- **Excellence:** All training at MBMIST is conducted with strong emphasis on international and national standards and competitiveness.

Members of Academic Board of MBMIST

Name	Position
Professor Effiom Essien Oku	Rector
James Ali Ijampy Adamu	Head, Department of Climate Change Science
Dr Adolphus C. Ifeka	Head, Department of Meteorology
Kamaladdeen Mu'azu	Coordinator of ND programme (Department of Climate Change Science)
Mohammed Bako Matazu	Coordinator of ND programme (Department of Meteorology)
Maikudi Gaddafi Abdullahi	Coordinator of Students Industrial work Experience Scheme (SIWES)
Muniratu Kaikai Muhammed	Head of Academic Planning
Sufyanu Abubakar	Head of Library
Dr Mukthar Abubakar Balarabe	Registrar

Why Study at MBMIST and Career Opportunities open to Graduates of MBMIST

Why Study at MBMIST

a) MBMIST is set up by the Nigerian Meteorological Agency (NiMet). The Agency has over 136 years and still counts the global record of training world-class Meteorologists and Climate Change Experts;

b) The Experts now hold management positions at WMO and across meteorological and climate related agencies in Western and Central Africa as well as in Nigeria;

c) The programmes curriculum is NBTE, WMO and ISO compliance;

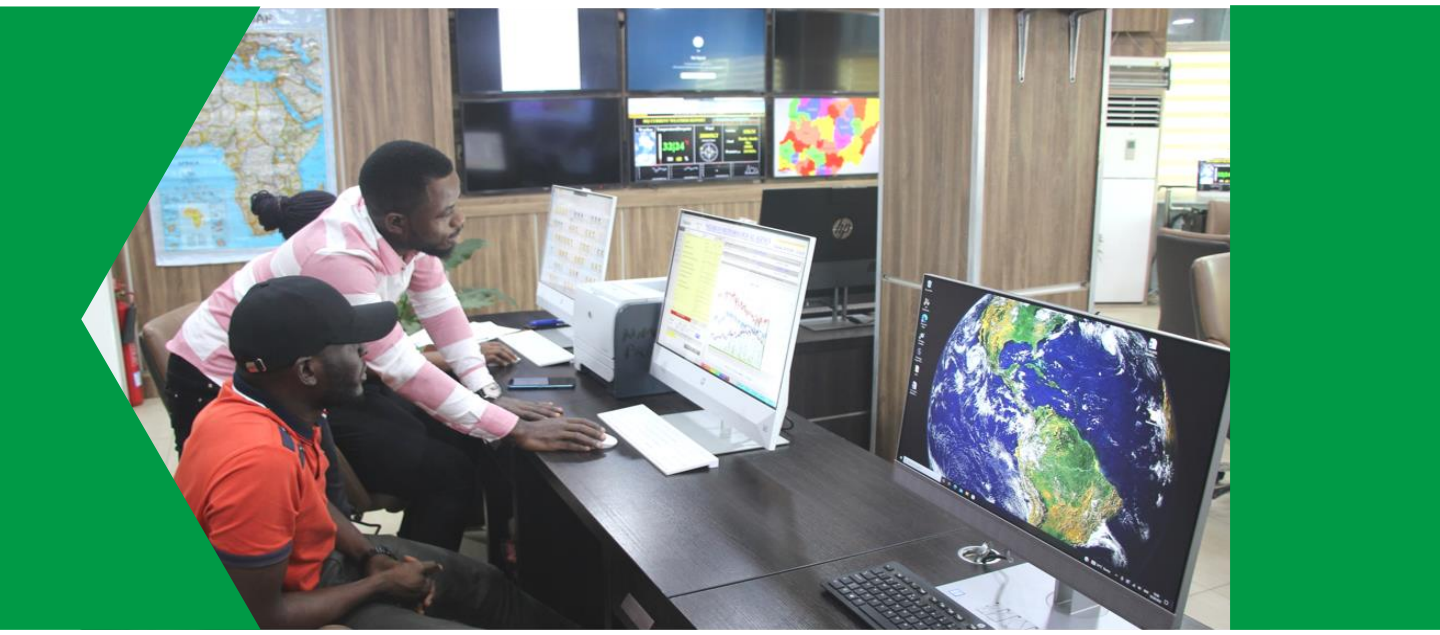
d) Lecturers at MBMIST are world class experts with WMO certification;

e) All field and laboratory facilities needed to train a 21st Century meteorologist and climate change science technologist are available on campus; and

f) Students are trained in class, field, laboratory, airports, agro-station, marine station, etc.

Career-wise, our Graduates fit into various Sectors of National and Global Economy and can find Career Opportunities in the;

a) Military: weather information guides and supports military (defence) operations in the air, land and sea;
b) Aviation: ground and air operations are guided by weather information and forecast;
c) Marine vessels and transportation rely on weather forecast for safety;
d) Agriculture activities being weather dependent sector;
e) Health (public health and safety): infectious and communicable diseases in humans and animals follow weather patterns and extreme events;
f) Water resources management relies on meteorologist for information;
g) Public weather and climate monitoring for events and general activities;
h) Off and onshore activity of oil and gas industry is guided by weather pattern and its forecast;
i) Building and construction industry for safety and efficient planning with weather monitoring and information;
j) Climate research and training;
k) Broadcast Meteorologists for the TV, radio, print media;
l) All public and private organization as sustainability/climate change officer in line with requirement of National Climate Act (NCA) of 2021; and
m) International Development Organizations and NGOs.



List of Academic Staff of the Department of Climate Change Science

S/N	Name of Staff	Sex	Specialisation	Qualification(s)	Rank
1.	Prof. Effiom E. Oku	M	• Climate Change Science • Soil Physics • Agrohydrology • Agro & forest Meteorology	• Ph.D. Soil Physics and Climate Change Science • MSc. Soil Physics and Agrohydrology • BSc. Agronomic Soil Science	Professor
2.	James Ali Ijampy Adamu	M	• Climate Change Science • Agro & forest Meteorology • Agrohydrology	• MSc. Agro-Meteorology and Climate Change Science • PGD Geography and Meteorology. • WMO Graduate Diploma (Meteorology) • B. Agriculture (Soil Science)	Senior Lecturer/ Chief Meteorologist
3.	Kamaladdeen Mu'azu	M	• Climate Science • Land Resources	• MSc. Land Resources Management • WMO Graduate Diploma (Meteorology) • BSc. Geography	Lecturer I/ Principal Meteorologist
4	Muhammad Ansar Gambo	M	Climatology Meteorology	• BSc. Geography • WMO Graduate Diploma (Meteorology)	Lecturer II/ Principal Meteorologist
5	Maikudi Gaddafi Abdullahi	M	• Earth Observation • Meteorology	• MSc. Geographic Information System • PGD Land Resource Management • BSc. Ed. Geography • WMO Graduate Diploma (Meteorology)	Lecturer II/ Senior Meteorologist
6	Dr. Bishir Gambo	M	• Desert Studies • Environmental Management	• PhD Environmental Science • MSc. Environmental Science • PGDEM Environmental Management • HND Agricultural Extension and Management	Visiting Principal Lecturer
7	Prof. Ojonigu Friday Ati	M	• Climatology • Climate Change • Geography	• PhD Geography • MSc. Geography • BSc. Geography	Visiting Professor
6	Dr. Ibrahim Lawal Kane	M	Statistics	• PhD Mathematics • MSc. Statistics • BSc. Statistics	Visiting Senior Lecturer
9	Dr. Rabi'u Tukur	M	Land Resource Development	• PhD Geography • MSc. Land Resource Development • BSc. Geography	Visiting Senior Lecturer
10	Dr. Amir Abdulazeez	M	Physical Geography	• PhD Geography • MSc. Geography • BSc. Geography	Visiting Lecturer 1

List of Academic Staff of the Department of Meteorological Science

S/N	Name of Staff	Sex	Specialisation	Qualification(s)	Rank
1.	Dr Mukhtar A. Balarabe	M	• Atmospheric Physics • Atmospheric Dynamics	• Ph.D Atmospheric Physics • Msc. Atmospheric Physics • BSc. Physics	Principal Lecturer
2.	Dr Adolphus C. Ifeka	M	• General Meteorology • Numeric Weather Prediction • Marine Meteorology	• Ph.D Meteorology & Climate Science • M.Tech. Meteorology • BSc. Geography & Meteorology • WMO Graduate Diploma (Meteorology)	Senior Lecturer/ Principal Meteorologist
3.	Joyce Imara Nchom Humphrey	F	• Medical Meteorology • Synoptic Meteorology	• Ph.D Meteorology • M.Sc. Meteorology • BSc. Geography • WMO Graduate Diploma (Meteorology)	Senior Lecturer/ Principal Meteorologist
4.	Mohammed B. Matazu	M	• Aviation Meteorology • Soil Physics • Atmospheric Dynamics	MSc Physics (Soil & Atmospheric Physics) BSc. Physics WMO Graduate Diploma (Meteorology)	Lecturer I/ Meteorologist I
5.	Umar Abubakar Mashi	M	Agricultural Meteorology	• B. Agriculture • WMO Graduate Diploma (Meteorology)	Lecturer II/ Meteorologist I
6.	Abba Yahaya	M	English Language	• MA. English	Lecturer II// Principal Administrative Officer
7.	Prof. A.U. Tambuwal	M	• Climatology • Hydrometerology • Water Resources Mgt. • Geography	• Ph.D Geography • MSc. Geography • BSc. Geography	Visiting Professor
8.	Dr.Yahaya Zayyana Ibrahim	M	• Earth Observation • GIS • Climatology	• Ph.D. Geography • (GIS & RS) • MSc. Land Resource Mgt. • BSc. Geography	Visiting Associate Professor
9.	Dr. Amir Abdulazeez	M	• Physical Geography	• PhD Geography • MSc. Geography • BSc. Geography	Visiting Lecturer 1

List of Academic Technologists in the Laboratory and Field

S/N	Name of Staff	Rank
1.	Mr. Iyal Abudulkadir	Meteorologist I
2.	Mr. Jafar I. Jaafsr	Senior Met Technician
3.	Mr. Ibrahim M. Alhassan	Met Technologist III

General Academic Information

Entry requirements for Admission into:

National Diploma Meteorology and National Diploma Climate Change Science

Minimum UTME score of 110.Candidates is required to have obtained a minimum of five (5) credit passes in SSCE, WAEC, GCE, NECO, NABTEB or equivalent in not more than two (2) sittings. The subjects must include: English language, Mathematics and (3) other subjects from Geography, Physics, Agriculture /Biology, Chemistry.

Registration Guidelines

Registration of students offered provisional admission into the institute is conducted in a central location and lasts for two weeks. Registration Process commences in the admission office and only candidates who are cleared after screening of their certificates as indicated by a stamp and signature of the officers involved may then proceed with the next stage of the registration.

The admitted candidates are advised to bring along the originals of the following documents for screening:

i. Admission letter and interview clearance;
ii. Academic certificates (SSCE 'O' Level, UTME scores etc.) to confirm that the student fulfils the Institute and Department entry requirements;
iii. Student names should correspond with the ones on the certificates; and
iv. Local Government Area of origin, birth certificate or court sworn age declaration.

Registration of courses for First and Second Semesters is done at the beginning of the first semester, usually within the first 1-2 weeks. Late registration is often not possible especially where large numbers of students have to be taught where facilities are in short supply.

The Department Registration Officer advises students on registration requirements and procedure. Students must register for all the courses.

Graduation Requirements

In order to graduate, a student must pass all the courses, take the minimum required credit units of all the courses at all levels see section (5.1), as well as satisfy other Diploma requirements specified under section (8.4).

Note: All the listed core courses will be offered every year and student must have obtained the free education requirements

Courses and Course Description for National Diploma Climate Change Science

National Diploma I
First Semester

Course Code	Course Title	Credit Units	Status
CCS 111	Introduction to Climatology and Climate Change Science	3	Core
CCS 112	Climatological Statistics	3	Core
CCS 113	Introduction to Remote Sensing and GIS	3	Core
CCS 114	Introduction Environmental Science	3	Core
GNS 101	Use of English	2	Core
MTH 112	Algebra and Elementary Trigonometry	2	Core
MET 111	General Meteorology	3	Core
GNS 111	Citizenship Education 1	2	Core
ICT 101	Introduction to Computing	3	Core

National Diploma I
Second Semester

Course Code	Course Title	Credit Units	Status
CCS 121	Extreme Weather Events and Disaster Management	3	Core
CCS 122	Use of GIS in Climate Analysis	3	Core
CCS 123	Regional Geography of Nigeria	3	Core
CCS 124	Climate Change Vulnerability	3	Core
CCS 125	Weather Observation and Forecasting	3	Core
CCS 126	Hydrology and Water Resources	3	Core
EED 126	Principle of Entrepreneurship 1	3	Core
MTH 211	Calculus	2	Core
GNS 102	Communication in English	2	Core

National Diploma II
First Semester

Course Code	Course Title	Credit Units	Status
CCS 211	Data Processing and Programming	3	Core
CCS 212	Climate Change Mitigation and Adaptation	3	Core
CCS 213	Climate Change and Human Health	3	Core
CCS 214	Quantitative Techniques for Climate Analysis	3	Core
CCS 215	Urban Climatology	2	Core
CCS 216	Field Work	3	Core
CCS 217	Research Methodology	2	Core
EED 216	Principle of Entrepreneurship II	3	Core

National Diploma II
Second Semester

Course Code	Course Title	Credit Units	Status
CCS 221	Regional Geography of Africa	3	Core
CCS 222	Climate Change and Energy	3	Core
CCS 223	Climate Change and Marine Science	3	Core
CCS 224	Climate Change and Agriculture	3	Core
CCS 225	Project	4	Core
CCS 226	Industrial Attachment	6	Core

Course Description for National Diploma (ND) Climate Change Science

CCS 111 Introduction to Climatology and Climate Change (3 Credit Units)

The basic concept of Climatology; Nature and Scope of Climatology, Weather and Climate, dynamic of the earth's atmosphere; General Circulation of the atmosphere, Radiation and Heating of the Earth's system, Condensation and precipitation processes, concept of the Climate Change and Climate Variability; History of Climate Change science, Green House Gasses emission and their main sources and effects, relevant institution concerned with Climate Change.

CCS 112 Climatological Statistics (3 Credit Units)

The concepts used in statistical analysis of Meteorological/Climatic data, basic concepts of probability and random variables in relation to weather and climatic phenomena, concepts of sampling theory, confidence intervals, and the hypothesis testing techniques.

CCS 113 Introduction to Remote Sensing and GIS (3 Credit Units)

Meaning, history and scope of Remote Sensing and GIS, components and advantages of GIS, sources of data and application areas of GIS, features of geospatial tools and their uses, techniques of mapping weather/climate and environmental data.

CCS 114 Introduction to Environmental Science (3 Credit Units)

Definition of environment, components of environment, interaction between the Environmental components, Biogeochemical cycles, Environmental pollution, Environmental degradation, Environmental Management systems.

GNS 101 Use of English (2 Credit Units)

Develop appropriate study skills, Nature of Language, Basic rules of grammar, essential qualities of paragraphs, appreciation of Literary works in English.

MTH 112 Algebra and Elementary Trigonometry (2 Credit Units)

Indices and Logarithm, Surds, Construction of Charts and Graphs, Quadratic equations, Permutation and Combination, Sets, Arithmetic and Geometric progression, Binomial theorem and its applications, Basic concepts of manipulation of Vectors and their applications, Trigonometry.

MET III General Meteorology (3 Credit Units)

Structure of the atmosphere, importance of Meteorology to humanity, physical processes of energy transfer from the sun to the earth, Applications of the physical processes of energy transfer, principles of atmosphere in weather information, roles of temperature in the study of climate variability, importance of moisture variables in the study of the atmosphere, concept of air flow, roles of wind and its effect on weather development.

GNS 111 Citizenship Education I (2 Credit Units)

Concept of citizenship; Renunciation and deprivation of citizenship, fundamental rights of citizens, limitation to the rights of citizens, responsibilities, duties and obligations of a Nigerian citizen, rule of law, constitution, federalism in Nigeria.

ICT 101 Introduction to Computing (3 Credit Units)

Definition, history and uses of computer, Windows Operating System, Management of Windows/Mac OS, concept of software packages (Word processing, Graphic, Spreadsheet and Database) and printing, Retrieval and Uploading information.

CCS 121 Extreme weather events and Disaster Management (3 Credit Units)

Definition of extreme weather events, Examples of extreme weather (extreme cold, blizzards and ice storm events, heat wave, drought, extreme rainfall, tropical cyclones, extra tropical cyclones, severe convective storms, wildfire etc.), impacts of extreme weather events (hazards and disasters), management strategies of disasters (early warning, monitoring, collaboration between relevant agencies, evaluation, resettlement), institutions and agencies relevant to disaster management.

CCS 122 Use of GIS in Climate Analysis (3 Credit Units)

Concept of geo-referencing and digitising maps/images, analysis of climatic elements using GIS, analysis of the impacts of climate change using GIS, climate change vulnerability assessment using GIS.

CCS 123 Regional Geography of Nigeria (3 Credit Units)

Location, size and boundaries of Nigeria, demography of Nigeria, physical environment of Nigeria, spatial distribution of socio-economic activities in Nigeria.

CCS 124 Climate Change Vulnerability (3 Credit Units)

Concept of Climate Change vulnerability, vulnerability of systems to Climate Change (Agriculture, Health, Biodiversity, Household, Transport etc.), Climate Change vulnerability assessment tools.

CCS 125 Weather Observation and Forecasting (3 Credit Units)

The concept of weather observation and forecasting, measurements of weather elements and their units, Meteorological messages, representation of Meteorological weather observations on maps/charts.

CCS 126 Hydrology and Water Resources (3 Credit Units)

Definition, scope and relevance of Hydrology, Hydrological cycles and its components, Nature of water and its availability, pollution of water resources, water resource management, relationship between Climate and Water Resources.

EED 126 Principle of Entrepreneurship 1 (3 Credit Units)

The basic concept of entrepreneurship; the roles of entrepreneurship in personal and national growth and development, setting of business goals, identifying business opportunities.

MTH 211 Calculus (2 Credit Units)

The basic concept of entrepreneurship; the roles of entrepreneurship in personal and national growth and development, setting of business goals, identifying business opportunities.

CCS 124 Climate Change Vulnerability (3 Credit Units)

Basic concepts of differential Calculus and their applications; reverse differentiation and its application, first order homogeneous linear ordinary equations with constant coefficient and its applications, partial differentiation.

GNS 102 Communication in English (2 Credit Units)

Concept of communication, oral presentations, essential elements of correspondence, rules of comprehension and interpretation.

CCS 211 Data processing and Programming (3 Credit Units)

Concept of data processing, the basic concept used in Computer programming; creating Basic programs using programming language, use of object-oriented programming (OOP).

CCS 212 Climate Change Mitigation and Adaptation (3 Credit Units)

Concept of Climate Change mitigation and adaptation; Climate Change mitigation and adaptation in different sectors, challenges of Climate Change mitigation and adaptation.

CCS 213 Climate Change and Human Health (3 Credit Units)

Concept of health and diseases, Climatic determinants of health, preventive measures and management of Climate-induced diseases.

CCS 214 Quantitative Techniques for Climate Analysis (3 Credit Units)

Concept of probability and random variables in relation to Climatic data, concept of sampling theory, confidence intervals and hypothesis testing, software packages for analysis of Meteorological/Climatic data.

CCS 215 Urban Climatology (2 Credit Units)

Concept of Urban Climate; Climatic parameters in urban areas, impacts of land use/land cover and population on Urban Heat Island (UHI), urban pollution and its effect on urban Climate, impacts of town planning on urban Climate, relationship between urbanization and weather events.

CCS 216 Field work (4 Credit Units)

Recognize and measure the drivers of Climate Change, demonstrate analytical and scientific report writing skills.

CCS 217 Research Methodology (2 Credit Units)

Research and its processes; basic principles of probability, use and importance of some measures of central tendency and measures of dispersion in summarizing data, methodology applied in research, various methods of data collection, presentation of research report.

EED 216 Principle of Entrepreneurship II

The various existing industries and support agencies in Nigeria, functions of management and the roles of a manager in an enterprise, strategies for consolidation and expansion of a business enterprise, practical aspects of running a business.

CCS 221 Regional Geography of Africa (3 Credit Units)

Location and size of Africa, demography of Africa, physical environment of Africa, spatial distribution of socio-economic activities in Africa.

CCS 222 Climate Change and Energy (3 Credit Units)

Basic concept of energy production, supply and demand; energy production, supply and demand relate to Greenhouse gas emission, impacts of energy production, supply and demand on Climate Change.

CCS 223 Climate Change and Marine Science (3 Credit Units)

Concept of Marine science; interaction between ocean Climate systems, impacts of Climate Change on Marine environment.

CCS 224 Climate Change and Agriculture (3 Credit Units)

General knowledge of Agriculture and Agricultural systems, relationship between Climatic elements and Agriculture, impacts of hydro/Meteorological hazards on Agricultural production, Nature of land use/land cover and Climate Change.

CCS 225 Project (4 Credit Units)

Review current literature pertaining to a specific issue or problem, assessment of the extent of the issue or problem in Climate Change practice, gathering and analysing information to identify potential solutions and reach a conclusion, and produce a final report on the project.

CCS 226 Industrial Attachment (6 Credit Units)

Expose students to industrial/working environments to acquire occupational skills, provide opportunities to apply educational knowledge into real work experience, and help infuse self-independence after graduation.

Courses and Course Description for National Diploma Meteorology

First Year (National Diploma I)

First Semester

Course Code	Course Title	Credit Units	Status
MET 111	General Meteorology	3	Core
MET 112	Aeronautical Meteorology	2	Core
MET 113	Meteorological Instruments and Maintenance	2	Core
MET 114	Environmental Pollution	2	Core
MET 115	Environmental Disaster and Risk Management	2	Core
MET 116	Climatology	2	Core
MET 117	Physics (Heat and Electricity)	3	Core
MTH 112	Algebra and Elementary Trigonometry	2	Core
ICT 101	Introduction to Computing	3	Core
CCS 113	Introduction to Remote Sensing and GIS	3	Core
GNS 101	Use of English	2	Core
GNS 111	Citizenship Education	2	Core

First Year (National Diploma I)
Second Semester

Course Code	Course Title	Credit Units	Status
MET 121	Codes and Observation	2	Core
MET 122	Plotting	2	Core
MET 123	Meteorological Statistics	3	Core
MET 124	Upper Air Observation	2	Core
MET 125	Aeronautical Meteorology II	3	Core
MET 126	Agricultural Meteorology	3	Core
MET 127	Marine Meteorology	3	Core
MET 128	Introduction to Fabrication and Calibration of Meteorological Instruments	3	Core
MTH 211	Calculus	3	Core
GNS 102	Communication in English	2	Core
EED 126	Principle of Entrepreneurship I	3	Core

Second Year (National Diploma I)
First Semester

Course Code	Course Title	Credit Units	Status
MET 212	Synoptic Meteorology	3	Core
MET 213	Vector Analysis	2	Core
MET 214	Climatological Returns	2	Core
MET 215	Differential Equations	3	Core
MET 216	Introduction to Hydrometeorology	2	Core
MET 217	Research Methodology	2	Core
MET 218	Field Work	3	Core
MET 219	Seminar	2	Core
CCS 211	Data Processing and Programming	3	Core
CCS 215	Urban Climatology	2	Core
EED 216	Principle of Entrepreneurship II	3	Core

Second Year (National Diploma I)
Second Semester

Course Code	Course Title	Credit Units	Status
MET 221	Dynamic Meteorology	3	Core
MET 222	Satellite Meteorology	3	Core
MET 223	Atmospheric Dynamics	3	Core
MET 224	Physical Meteorology	3	Core
MET 225	Synoptic Weather Analysis	3	Core
MET 226	Climate Change Studies	2	Core
MET 227	Research Project	4	Core
MET228	Industrial Attachment	6	Core

Course Description for National Diploma (ND) Meteorology

MET III General Meteorology (3 Credit Units)

Structure of the atmosphere, importance of Meteorology to humanity physical processes of energy transfer from the sun to the earth, Applications of the physical processing energy transfer, principles of atmosphere in weather information roles of temperature in the study of climate variability, importance of moisture variables in the study of the atmosphere, concept of air flow, role of wind and its effect on weather development.

MET 112 Aeronautical Meteorology I (2 Credit Units)

Different definitions of term commonly used in Aeronautical Meteorology, weather variables in Aeronautical information, Dissemination of weather information, Hazarders weather phenomena as it affects aircraft operations Air Traffic Services, Responsibilities of International Civil Aviation Organization (ICAO) and Word Meteorology Organization (WMO) in the field of Aeronautical Meteorology.

MET 113 Meteorology Instrument and Maintenance (2 Credit Units)

Essential elements of Meteorological Measuring Instruments, classification of Meteorological Instruments, involving principle meteorological instruments, maintaining basic meteorological instruments.

MET 114 Environmental Pollution (2 Credit Units)

General concept of Pollution, types of environmental pollutants, Relationship between Meteorology and Pollution quality standard and guidelines sampling and analysis of pollution, Risk assessment, prevention and control of pollution.

MET 115 Introduction to Environmental Disaster and Risk Management (2 Credits)

Concept, types and components of the environment, concepts and types of hazards, meaning and causes of disaster & risk Management. Various Disaster risk Management networks and communities.

MET 116 Climatology (3 Credit Units)

Basic concept of climatology, Dynamic of the earth's atmosphere, Basic concepts of climate change.

MET 117 Physics (Heat and Electricity) (3 Credit Units)

Concept of heat, heat sources, temperature and temperature scales, Different types of thermometers, effects of heat on matter, processes of heat transfer in the atmosphere, kinetic theory of gases and its applications to the atmosphere, concepts of electricity and electrostatics, electric fields: equipotential, electric potential, potential gradient, chemical effects of current, electromagnetism and its application.

CCS 113 Introduction to Remote Sensing and GIS (3 Credit Units)

Meaning, history and scope of Remote Sensing and GIS, components and advantages of GIS, sources of data and application areas of GIS, features of geospatial tools and their uses, techniques of mapping weather/climate and environmental data.

MTH 112 Algebra and Elementary Trigonometry (2 Credit Units)

Indices and Logarithm, Surds, Construction of Charts and Graphs, Quadratic equations, Permutation and Combination, Sets, Arithmetic and Geometric progression, Binomial theorem and its applications, Basic concepts of manipulation of Vectors and their applications, Trigonometry.

ICT 101 Introduction to Computing (3 Credit Units)

Definition, history and uses of computer, Windows Operating System, Management of Windows/Mac OS, concept of software packages (Word processing, Graphic, Spreadsheet and Database) and printing, Retrieval and Uploading information.

GNS 101 Use of English (2 credit units)

Develop appropriate study skills, Nature of Language, Basic rules of grammar, essential qualities of paragraphs, appreciation of Literary works in English.

GNS 111 Citizenship Education I (2 Credit Units)

Concept of citizenship; Renunciation and deprivation of citizenship, fundamental rights of citizens, limitation to the rights of citizens, responsibilities, duties and obligations of a Nigerian citizen, rule of law, constitution, federalism in Nigeria.

MET 121 Codes and Observation (3 Credit Units)

Procedures of weather observations, methods of measurement of meteorological variables, use of humidity slide rule in computation, cloud observations, measurement of evaporation, procedures of coding and coding of meteorological messages.

MET122 Plotting (2 Credit Units)

Plotting models and tables, weather symbols, represent data on charts.

MET123 Meteorological Statistics (3 Credit Units)

Principles of statistical analysis for meteorological data, methods of obtaining data and how to avoid common design flaws that lead to bias and inefficiency, apply fundamental concepts of probability and random variables in relation to weather phenomena, concept of sampling theory, foundations for classical inference involving confidence intervals and hypothesis testing, concept of some software packages for meteorological/climatic data analysis.

MET 124 Upper Observations (2 Credit Units)

Concept of upper air observation, types of upper air observation, generation of hydrogen gas, practical demonstration of upper air ascents, generation, computation and interpretation of upper air data.

MET 125 Aeronautical Meteorology II (3 Credit Units)

Concept and issuance of meteorological warnings, generate and issue aeronautical meteorological forecasts, concept of briefing and issuance of aeronautical flight documentation.

MET 126 Agricultural Meteorology (3 Credit Units)

Concept of Agro Meteorology, types of agro meteorological stations, agro meteorological elements and their methods of observations, relationship between weather/climate, agriculture and associated sciences, concept of artificial modification of meteorological and hydrological regimes, general production practice of field crops and livestock, livestock and crop pest/diseases management, concepts of evaporation, transpiration and evapotranspiration.

MET 127 Marine Meteorology (3 Credit Units)

Basic marine meteorological services, technicalities involved with marine observation, ocean current circulation, ocean temperature and its influence on weather, oceanic hazards affecting marine activities.

MET 128 Introduction to Fabrication and Calibration of Meteorological Instruments

Concepts of fabrication and workshop safety rules, basic fabrication tools and how to use them, processes and raw materials in fabrication, essential components of a measurement system, concepts of measurement errors and uncertainty measurement, principles of calibration in measurement.

EED 126 Principle of Entrepreneurship 1 (3 Credit Units)

The basic concept of entrepreneurship; the roles of entrepreneurship in personal and national growth and development, setting of business goals, identifying business opportunities.

MTH 211 Calculus (2 Credit Units)

Basic concepts of differential Calculus and their applications; reverse differentiation and its application, first order homogeneous linear ordinary equations with constant coefficient and its applications, partial differentiation.

GNS 102 Communication in English (2 Credit Units)

Concept of communication, oral presentations, essential elements of correspondence, rules of comprehension and interpretation

MET 212 Synoptic Meteorology (3 Credit Units)

Synoptic features on weather maps, numerical weather prediction (NWP) models, satellite image and radar, synthesis of synoptic systems on weather in West Africa.

MET 213 Vector Analysis (2 credit units)

Concept of vector Analysis Manipulate Vector to perform geometric and physical calculations, calculate and interpret vector derivatives and simple vector integrals.

MET 214 Climatology Return (2 Credit Units)

Concept of climatological returns, climatological forms, compilation of climatological returns, socio-economic importance of climatological returns.

MET 215 Differentiate Equations (2 Credit Units)

Order and degree of ordinary differential equations, partial differential equations of first and second order differential equations and partial equations and partial equations.

MET 216 Introduction to Hydrometeorology (2 Credit Units)

Relationship between Hydrology and Meteorology, components of water cycle, nature of water and its availability in time & space, water resources management, form of available water resources, Relationship between climate and water resources.

MET 217 Research Methodology (2 Credit Units)

Concept of Research, Different types of research, research format, referencing systems in research.

MET 218 Field Work (3 Credit Units)

Recognize and measure the drivers of climate change, demonstrate analytical and scientific report writing skills.

CCS 211 Data Processing and Programming (3 Credit Units)

Concept of data processing, the basic concept used in Computer programming; creating Basic programs using programming language, use of object-oriented programming (OOP).

EED 216 Principle of Entrepreneurship II

The various existing industries and support agencies in Nigeria, functions of management and the roles of a manager in an enterprise, strategies for consolidation and expansion of a business enterprise, practical aspects of running a business

MET 221 Dynamic Meteorology (3 Credit Units)

Concept of dynamic meteorology, equation of motion in terms of forces and frames of reference, application of scale analysis to identify the dynamic processes in balanced flows, basic concept of circulation and outflow, the principles of divergence and vorticity.

MET 222 Satellite Meteorology (3 Credit Units)

Concept of remote sensing, principles of radiation measurements used for active and passive remote sensing, satellite environment, orbital characteristics and launch profiles, information from passive systems such as satellites are used to provide digital data, interpretation of satellite imageries.

MET 223 Atmospheric Dynamics (3 Credit Units)

Concepts of atmospheric dynamics systems and processes, basic mathematical and physical principles to solve thermodynamic problems, analyze and interpret tephigram charts.

MET 224 Physical Meteorology (3 Credit Units)

Structure and composition of the atmosphere, processes of radiative transfer and the causes of optical phenomena in the atmosphere, concept of stability in the atmosphere, role of water vapour on thermodynamics processes and formation of clouds, synoptic conditions necessary for the formation of hydrometeors, atmospheric electricity and electrical phenomena.

MET 225 Synoptic Weather Analysis (3 Credit Units)

Carry out synoptic weather chart analysis, Numerical Weather Prediction (NWP) chart analysis, Plot and deduce important parameters on the tephigram (T-Φgram) chart, interpret satellite and radar information.

MET 226 Climate Change Studies (2 Credit Units)

Concepts of climate, climate variability and climate change, history and theories of climate change studies, greenhouse gases and their sources of emissions, causes of climate change and their impacts, climate change adaptation and mitigation measures, protocols and conventions on climate change, institutions concerned with climate change.

MET 227 Research Project (4 Credit Units)

Research by students into selected topics in Meteorology. Each student is expected to carry out literature survey on an assigned topic, perform experiments and produce a report. Students will be subjected to oral examinations on their projects.

MET 228: Industrial Attachment (6 Credit Units)

Students are to be attached to relevant organisations for six (6) months for real- time practical experience in meteorology. Students are to be assessed based on written reports, seminar presentations and assessments by supervisors.

Service Courses

The two departments offer service courses related to climate change science and Meteorology.

Lecture Timetables

See appropriate Notice Boards

Examination Requirement and Timetable

In order to be admitted to any examinations a student must have registered for the course to be examined and must have fulfilled all the institution's requirements concerning residence, fees or other matters. In addition, at least 75 % attendance is required in all courses, laboratories, etc. to qualify to sit for semester examinations.
The student must also have fulfilled all department requirements regarding attendance at or satisfactory completion of any course work, practical, assignments, projects or other matters.

It is the responsibility of the Department examination office to set a timetable giving the dates, time and venue of the examinations in advance of the examination date. Other matters relating to the examination, including discipline during examination may be found in the general Institute Students' Handbook

Examinations Regulations

Credible examination is the main measure used in determining the success or otherwise of the Departmental examination office and if any student is found engaged in Examination irregularities he/she will be disciplined accordingly.

Examinations are a very important component of a student's academic life. Students are expected to familiarize themselves with examination rules and regulations in each respective course. They should ensure that they have fulfilled all the examination requirements in each progress examination which are as follow:

1. Students should note that a minimum attendance of 75 % will be required to qualify a student to sit for any examination. In health-related cases a medical report is required. Attendance and continuous assessment form 40% of their course grading, while the examination is 60 %;
2. Lateness to the examination venues will not be tolerated and no student will be allowed to enter an examination hall 20 minutes after the start of the examination;
3. Students are advised to ensure that at no time do they carry unauthorised materials such as notes, books, handbags, phones etc. into the examination hall. However, where a particular course requires the use of tables, graphs, charts etc., the department shall supply these during examinations. Students are advised to search themselves before entering the examination halls;
4. Any student caught cheating in examination for example, by copying, having or making reference to unauthorised materials, any form of communication, will be awarded zero in that course. Students who need clarification are advised to raise their hands to draw the attention of the Invigilator;
5. If a student is caught twice (in two courses) in the same examination, he shall not be eligible (based on examination committee recommendation) to sit for the remaining examination and he will be awarded zero in the affected courses;
6. Students are expected to go into examination halls with their Ball pens, erasers, rulers, pencils and any other materials that are permitted. No borrowing of any material is allowed during examinations;

7. All the eligible students are expected to put on their institute identity cards, show their examination card and also fill (their name, examination script number, their registration number and also append their signature) in the attendant register before and after each examination;
8. Under no circumstance should the answer booklet, used or unused, be removed from the examination hall, mutilated or tampered with by a student;
9. No Student is allowed to leave the examination hall without handing over the examination script to the Invigilator. On handing over the script, the student must ensure that he/she signs out on the attendance register. However, students are not permitted to leave the examination hall without the permission of the Invigilator, who may wish to reconcile the number of scripts with the number of students present in the hall;
10. No schedule will be made for any student who missed examinations due to ill health or other reasons e.g. bereavement. Such students will carry the course(s) over;
11. Examination results will be ready three weeks after each examination; and
12. Academic transcripts will be available at the end of each academic Programme and are issued on application to the Registrar.

Assessment and Grade Point Average Computation

Assessment, Letter Grades and Grade Points

Marked Range	Letter Grade	Weighting
75% and above	A	4.00
70%-74%	AB	3.50
65%-69%	B	3.25
60%-64%	BC	3.00
55%-59%	C	2.75
50%-54%	CD	2.50
45%-49%	D	2.25
40%-44%	E	2.00
Below 40%	F	0.00

Example of G.P.A. Computation

Courses	Credit Unit (CU)	Grade Earned	Grade Point (GP)	Total Point (TP) CU x GP
CCS 111 Introduction to Climatology	3	AB	3.50	10.5
CCS 112 Climatological Statistics	3	A	4.00	12
CCS 113 Introduction to Remote Sensing and GIS	3	E	2.00	6
CCS 114 Introduction Environmental Science	3	CD	2.50	7.5
GNS 101 Use of English	2	C	2.75	5.5
MTH 112 Algebra and Elementary Trigonometry	2	D	2.25	4.5
MET 111 General Meteorology	3	BC	3.00	9
GNS 111Citizenship Education 1	2	F	0.00	0
ICT 101 Introduction to Computing	3	B	3.25	9.75
TOTAL REGISTERED CREDIT UNIT (TRCU)	24			64.75

Courses	Credit Unit (CU)	Grade Earned	Grade Point (GP)	Total Point (TP) CU x GP
CCS 121 Extreme Weather Events and Disaster Management	3	A	4.00	12
CCS 122 Use of GIS in Climate Analysis	3	E	2.00	6
CCS 123 Regional Geography of Nigeria	3	CD	2.50	7.5
CCS 124 Climate Change Vulnerability	3	BC	3.00	9
CCS 125 Weather Observation and Forecasting	3	C	2.75	8.25
CCS 126 Hydrology and Water Resources	3	D	2.25	6.75
EED 126 Principle of Entrepreneurship 1	3	AB	3.50	10.5
MTH 211 Calculus	2	F	0.00	0
GNS 102 Communication in English	2	B	3.25	6.5
TOTAL REGISTERED CREDIT UNIT(TRCU)	25			66.5

GPA and CGPA Calculation

- For one semester, the Grade Point Average (GPA) is obtained from the equation:
  Grade Point Average (GPA) = Total Credit Point (TCP)/Total Credit Unit Registered.

  Therefore; Grade Point Average (GPA) = 64.75/24 = 2.70

- For more than one semester, the Cumulative Grade Point Average (CGPA) is obtained by applying the equation to the cumulative TCP and the cumulative TRCU over all the semesters.

- Example;
  CGPA TCP (1st Semester) + TCP (2nd Semester)/TRCU (1st Semester) + TCP (2nd Semester)
  CGPA = 64.75 + 66.5/24 + 25 = 131.25/49,

  Therefore CGPA =2.68

Academic Warning, Probation and Withdrawal

- If the GPA of a student in any semester is less than 2.00 as the case may be, a warning shall be sent by the registry to such student and his/her workload be limited to not more than the minimum credit hours recommended.
- To obtain overall pass in a semester, a student must maintain a CGPA of at least 2.00. When the student's CGPA falls below 2.00 for two consecutive semesters, the student is put on probation. When the CGPA falls below 2.00 for 3 consecutive semesters, the student is withdrawn from the Programme

Diploma Requirements

The National Diploma in Climate Change Science and Meteorology shall be awarded to only persons who have satisfied all conditions for the award of the certificate as laid down by the National Board for Technical Education (NBTE) and the institution in which the Programme is offered.

Diploma Classification

National Diploma (ND) shall be based on a total of 4 points classified into the following categories;

- Distinction: CGPA of 3.50 and above
- Upper Credit: CGPA of 3.00 – 3.49
- Lower Credit: CGPA of 2.50 – 2.99
- Pass: CGPA of 2.00 – 2.49

Academic Awards Registrar's Honors List (RL)

A student is placed on the Registrar's Honors List if he/she has at least a GPA of 3.50 to 4.00 as the case may be in any semester. The student shall be commended for his/her academic excellence in writing by the Registrar.

Academic Excellence Achievement Award (HL)

A student is issued with an Academic Excellence and Achievement Award at the end of the Programme if his/her CGPA is at least 3.50 to 4.00 as the case may be.

Glossary:

Commissioning Ceremony of the Institute by The President, Federal Republic of Nigeria and Commander-in-Chief of the Armed Forces, President Muhammadu Buhari on 26th January, 2023

MBMIST
MUHAMMADU BUHARI METEOROLOGICAL INSTITUTE OF SCIENCE AND TECHNOLOGY
Kastina, Nigeria
Safety, Innovation, Excellence

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