



Science Teachers Association of Nigeria

60TH ANNIVERSARY CONFERENCE

14 - 19 August, 2017

THEME

STEM and Society

VENUE

**Ignatius Ajuru University of Education, Rumuolumeni,
Port Harcourt, Rivers State**

ARRIVAL DATE

Monday, 14 August, 2017

DEPARTURE DATE

Saturday, 19 August, 2017

CONFERENCE THEME

STEM and Society

SUB-THEMES

- STEM for all citizens
- STEM in support of democratic institutions
- STEM for socioeconomic empowerment
- Teachers and STEM in society

CALL FOR PAPERS

In addition to the sub-themes, delegates may also make presentations at the following subject panels: Agricultural Science, Basic Science, Basic Science & Technology, Biology, Chemistry, Computer Studies, Environmental Education, Gender and STM Education, Home Economics, Information & Communications Technology, Mathematics, Physical & Health Education, Physics, Science-Technology-Society, Teacher Education, and Technology Education, STAN will also mount Subject Panel Modular workshops at the conference.

Important

The Association plans to produce the 'Conference Proceedings' in printed form for distribution during the conference. Consequently, all paper presenters are to prepare their papers in time and subject them to peer review (to enhance possibility of selection). The paper should be computer-processed using 12 point type for the text/subheadings and 14 point type for headings. All headings and sub-headings should be in bold prints.

Papers must be submitted directly at the STAN website, www.stanonline.org, using the following steps:

- * Click on "STAN Conference" on the home page
- * Click on "Call for papers"
- * Fill in your abstract and upload paper

*Check that all required information has been supplied, and then you can click on the "SUBMIT" button. This means your conference paper has been submitted to the Editor-in-Chief.

To guard against a situation where papers are not presented at the Conference due to absenteeism, it is now mandatory for prospective presenters to demonstrate their readiness to attend the

Conference at the time of submitting papers for processing.

To this end, every prospective presenter has to remit the conference registration fee of N7,300 (seven thousand three hundred naira only) to STAN before paper submission. All presenters and non-presenters are to remit conference fees via the STAN website as described below:

1. Register as a member on the website www.stanonline.org by completing an online membership form and uploading your passport-sized photograph. The photograph should be taken in a standard studio such as Phototek. This is done once and for all. A member ID will be generated for you. Please keep your Member ID. (If you have earlier completed the form, skip this step).
2. Login onto the Registered Member area with your Member ID, Surname & Password
3. Click on "Make New Payment" to make new payment
4. Click on the particular item which you want to make payment for
5. Enter year which you are paying for, in case of "Annual Subscription" or "Annual Conference"
6. Choose "In-Branch" Payment Option:

7. (i) An Online invoice will be generated for you.
(ii) Print out the Invoice and keep it.
(iii) Transaction ID will be generated for you. Keep it for future reference.

If you selected In-Branch Payment Option, follow these steps:

1. Logout from the Members' area
2. Go to any of the following Banks with the computer generated invoice and make payment (Transaction ID, Membership ID & Surname should be extracted from the invoice):
 - First Bank of Nigeria Plc
 - Guaranty Trust Bank Plc
 - United Bank for Africa Plc
3. Once you pay at a designated bank, the Bank will generate Confirmation ID and Receipt No (Teller No) for you.
4. Go back to the Website and Login with your Member ID, Surname & Password
5. Click on "Complete Payment" in order to complete your payment
6. Enter your Transaction ID, Receipt No (Teller No) and Confirmation No.
7. A Confirmation Invoice will be generated for you
8. Click on "Submit" to complete the payment
9. E-Receipt will be generated for you once your payment is confirmed. Print out the E-Receipt and keep it.
10. Logout

NOTES

1. This scheme has taken off. Accordingly, all members are strongly advised not to make payments directly into STAN Bank Accounts as was the case before except in a few cases where the STAN Headquarters will so advise.
2. Payments have to be made individually as each member will have a record in the data base.
3. Where in difficulty, please call 0708 274 3110 or 0805 196 9227.

However, while presenters must pay before 28 April, 2017, other members are at liberty to make such payments at any convenient time before the conference.

Caution

Authors whose articles are accepted and published in the conference proceedings who fail to personally present their papers at the conference will be **BARRED** from publishing articles in STAN publications and membership of STAN National Committees for three consecutive years.

Summary

Remit conference registration fee and submit conference paper all through the STAN website before Friday, 28 April, 2017. Call **0708 274 3110** or **0805 196 9227** for assistance where necessary.

HOTEL TARIFF IN PORT HARCOURT

S/N	NAME & ADDRESS OF HOTEL	CLASS OF ROOMS	NUMBER	RATE (₦)
1	De Reggy's Hotel & Suites No. 19 Ada George Road, Mgbuoba, Port Harcourt 08144164668, 090526211448	Single Executive Double Royal Suite	11 16 3	6,500 8,000 15,000
2	Stinson Hotels Limited 2/3 Hosanna Close, off Ada George Road, Port Harcourt 08162306113	V.I.P Diamond Executive Gold Silver Bronze	2 2 9 8 7	25,000 20,000 15,000 11,000 9,000
3	Palm Spring Suites Ada George Road, Port Harcourt 08093305009, 08173330371	Deluxe Room Deluxe Extra Room Executive Room	4	8,000 10,000 15,000
4	Sanclin Hotels NO. 4 Eternity Drive Off Eliparanwo Road, Port Harcourt	Sapphire Ruby (deluxe) Diamond (Deluxe) Crystal (deluxe) Single Room Double Room Executive Room	11 1 1 1	15,000 10,000 10,000 10,000 6,000 7,000 8,000
5	City Crown Hotels Limited 58 Iwofe Road, Port Harcourt 07033174551	Standard Double a Standard Double B Executive Double Deluxe Standard Suite Royal Size	20 20 20 20 20 20	7,000 6,000 8,000 10,000 15,000 20,000
6	Ebekendy Hotels Limited Plot 70, Graceland Road GRA, Port Harcourt	Standard Room Elegant Room Luxury Mini Deluxe		16,000 18,000 25,000 35,000
7	Tocville Garden & Suite No. 234 Ada George Road, Port Harcourt 08107080272	Studio 1 Studio 2 Deluxe Super Deluxe Big Suite Family Suite	4 32 4 4 3 2	7,000 9,000 16,000 12,000 20,000 25,000
8	Clen-Phil Hotel & Suites No. 68 Iwofe Road, Mile 4 beside Anele Oil, by St. Michael Junction, Port Harcourt 08132637550, 08060672064	Standard Room Deluxe Standard Executive Room	11 6	5,000 6,000 10,000
9	Hartford Hotel Limited No. 50 Wimpy/Iwofe Road by Ada George, Port Harcourt 08133927098	Ruby Room Diamond Room Royal Room		7,000 9,000 12,000
10	City Express Hotel No. 30 Nyesirim, Off Ada George Road, Port Harcourt 07033020247	Standard Super Standard Executive Double Royal Deluxe Executive Suite City home	9 9 9 9 9 9	6,500
11	Londa Hotel 24B Ebere Orazi Road, Mile 4, Port Harcourt 08033127980	Standard Super Standard Double Deluxe	6 4 15 8	7,000 8,000 9,000 10,000

12	Eastlake Hotels Plot 109 GRA, Phase III, No. 7 Royal Crescent Off Prof. Abowei Street, Port Harcourt 09096699559, 08149448000	Deluxe Super deluxe Executive Royal Suite Meeting Room Event Hall		15,000 20,000 25,000 30,000 35,000 50,000 250,000
13	De Edge Hotel Off Graceland Road GRA, Port Harcourt	Classic Executive Junior Presidential Suites		22,000 28,000 35,000 75,000
14	De Itarri's Hotels 13, Monima Close Off Eagle Cement Road Rumuolumeni, Port Harcourt 07038483323	Classic Deluxe Room Suites Pent House	1 15 2 1	10,000 10,000 10,000
15	Anitel Royal Suite #3 Trans-Kalabari Road, Port Harcourt 08038785862	Deluxe Room	12	4,000
16	Ray Des #135 Aker Road Rumuolumeni, Port Harcourt 0806553745	Economy Standard Executive	7 5 4	4,000 5,000 6,000
17	Leezon Hotel & Suites Km 1.5 Ogbogoro/Eleparanwo Road, Port Harcourt 08131841244	Single Standard Deluxe Executive	3 9 3 2	6,000 6,000 7,000 10,000
18	Sparklyn Hotel & Suites 10 Bookstores close Griphase 3, Port Harcourt 08169846914	Standard Executive Double Executive Royal Suite		24,000 24,000 24,000 24,000
19	Davy Hotels & Apartments 21 Prof. Abowu Street, GRA, Port Harcourt 08036761175	Standard Executive Double Executive Royal Suite		7000 15000 13000 30000
20	Belyx lodge Trinty Str. Off St John, Port Harcourt 0803876216	Standard	13	4000
21	Larrited Hotels limited 166 NTA/Choba Road Port Harcourt	Single Double Star Double	10 6 4	4000 5000 6000
22	Max-Chef Hotels Limited PIF. 4 Maxwell Owabie Str. Iwofe Rd by Ada George. Port Haecourt 07008808800	Single Royal Delune Suite		6000 7500 12000
23	Base Hotel 33 NTA Road, Port Harcourt	Standard room Double rooms		7000 10000

Hostel Accommodation N1,500

SPECIAL WORKSHOPS

The Science Teachers Association of Nigeria (STAN) will mount the following workshops at the Annual Conference:

AGRICULTURAL SCIENCE

COURSE TITLES & CODES (Modules)	COURSE UNITS	Course Contents/Descriptions
STAN AGS 107 Simple Farm Tools (Module 7) (PRIMARY)	Unit 1: Meaning and types	Meaning and examples of simple farm tools; Crop farm tools (spade, shovel, machet, pick axe, rake, wheel barrow e.t.c); Animal farm tools (fishing nets, traps, hooks and line, baskets, watering trough, feeding trough etc).
	Unit 2: Maintenance of farm tools	Maintenance and care of the tools through good storage, clean and dry, apply oil where necessary, sharpening blunt edges; damages that may occur to farm tools and preventive measures
	Unit 3: Farm Records	Definition of simple farm records; Importance of farm records; Types and uses of farm records; Computer aided farm records and benefits
STAN AGS 207 Feeds and Feeding (Module 7) (JUNIOR SECONDARY)	Unit 1: Definitions and types of feed and feeding	Definitions of feed and feeding; Types of feed stuff; Uses of the various types of feed stuff
	Unit 2: Feed tools and Feed Production	Meaning and types of feed tools; Maintenance and management of feeding tools; compoundment/production of feed stuff
STAN AGS 302: Crop Production (Module 2) (SENIOR SECONDARY)	Unit 1: Husbandry of selected crops	Methods of propagation; climate and soil requirements; Land preparation, planting dates, seed rate, spacing, sowing depth and nursery requirements; Manuring and fertilizer requirements and application: Harvesting, Processing and storage of selected crops.
	Unit 2: Disease of crops	Diseases of major crops such as cereal (smut, Rice blast), Legumes (Cercospora leaf spot, Rosette), Beverage (Cocoa black pod, Coffee leaf rust), Tuber (Cassava mosaic virus, bacterial leaf blight), Fibre (black arm, bacterial blight), vegetable (root-knot of tomato or okra, cotton twister), Stored produce (moulds). Description of symptoms of the identified diseases; Economic importance of the diseases; Prevention and control measures (cultural methods, biological methods, chemical methods)
	Unit 3: Pest of crops	Important insect pests of major crops Legumes (Pod borer, Aphids, sucking bugs, Leaf beetle), Beverage (Cocoa myrids); Tubers (Yam beetle, Cassava mealybug, Green epidermite, Varigated grasshopper); Fibre (Cotton stainer, boll worm); Fruits and vegetables (thrips, grasshoppers, leaf roller, leaf beetle, scale insect); Stored produce (grain weevil, bean beetle); Other important pests like birds, rodents. Economic importance of each selected pests, prevention and control (cultural, biological and chemical methods)
	Unit 4: Pasture and forage crops	Morphology of common grasses and legume species of Nigeria pastures; Types of pastures; Factors affecting productivity, establishment and management
	Unit 5: Forest Management	Forest regulations; Selective exploration; deforestation; Regeneration; Afforestation; Taungya system
	Unit 6: Crop Improvement	Meaning and aims of crop improvement; Mendelian laws; Processes of crop improvement (introduction, selection, breeding).

BASIC SCIENCE

COURSE TITLES & CODES (Modules)	COURSE UNITS	Course Contents/Descriptions
STAN BSC 207: Controlling the Environment (Module Seven) (JUNIOR SECONDARY)	Unit 1; Environmental Sanitation	Community disposal of refuse in villages and towns. The balance of nature in the villages. Compost
	Unit 2: Sewage	Sewage: outdoor latrines, flush toilets – necessity for water system.
	Unit 3: Disease Vectors	Disease vectors. Life cycle of mosquito. Water drainage. Insecticides. Oil spreading/sparing. Life cycle of housefly. Flies as germ carriers. River blindness and sleeping sickness.
	Unit 4: Preventive Medicine (clean water & Immunization)	Cholera. Diarrhea. Typhoid. Pipe-borne water. Water treatment processes. Vaccination. Inoculation. The conquering of small pox in Nigeria.
	Unit 5; Maintaining Balance in the Environment and wild Life Conservation	Factors that control population growth. Effects of limited and unlimited growth. Man's activity are reducing wildlife. Wildlife role in balanced environment relates to the wellbeing of other organisms and man. Wildlife reserves in Nigeria.
	Unit 6: Air and Water Pollution	Kinds of air pollution and their effects. Pollutants from the home. Pollutants from industry and Agriculture. Effects and control of air pollution. Effects and control of water pollution.
	Unit 7: Erosion and Flooding	Causes and prevention of erosion. Causes of flooding. Drainage patterns. Prevention of flooding
	Unit 8: Oil Spillage and burning of natural gas	The effects of oil spillage and burning of natural gas on the environment.
	Unit 9: Our Disappearing forests	Human activities and roles in disappearing forests in West Africa. Encroaching deserts. Replanting our forests
	Unit 10: Controlling the Weather	Simple conditions of weather – temperature, humidity, barometric pressure, kinds of clouds, precipitation, haze, visibility, storm, lightening, and thunder. Weather maps – wind direction, isobars etc

BASIC SCIENCE AND TECHNOLOGY

COURSE TITLES & CODES (Modules)	COURSE UNITS	Course Contents/Descriptions
STAN BST 106 Simple Machines And Safety (Module Six) (PRIMARY)	Unit 1: Types & uses of simple machines	Definition/meaning of simple machines. Specific types and uses of simple machines.
	Unit 2: Safety Precautions	Meaning of safety. Cause and prevention of accidents. Safety precautions. Content of first aid box and their uses.

BIOLOGY

COURSE TITLES & CODES (Modules)	COURSE UNITS	Course Contents/Descriptions
STAN BIO 304 The Cell (Module 4) (SENIOR SECONDARY)	Unit 1: Nature of the Cell	Cell as a living Unit, forms in which cells exist (as independent organism, as a filament, as a colony). Cells as part of living organisms, cell structure (the cell theory, structure and functions of cell components, differences and similarities between plant and animal cells

Unit 2: The Cell and its Environment	Diffusion (definition, process, significance), Osmosis (diffusion of water through membrane, diffusion through a semi-permeable membrane, haemolysis, plasmolysis, osmometer with living materials, biological significance of osmosis.)
Unit 3: Feeding	Definition and types, micronutrients and macro nutrients

CHEMISTRY

COURSE TITLES & CODES (Modules)	COURSE UNITS	Course Contents/Descriptions
STAN CHE 304 Chemical Combination & Chemical Reactions II (Module 4) (SENIOR SECONDARY)	Unit 1: Electrolysis	Electrolysis; Effects of electrolysis on matter; Ionic theory; Ionic theory; Electrolytes and non electrolytes; Preferential discharge of ion during electrolysis; Electrolysis of some common electrolytes; Laws of electrolysis; Uses of electrolytes; Electrode potential; the e.m.f of a cell; Electrochemical cells
	Unit 2: Chemical Reactions	Types of chemical reactions; rates of chemical reactions; Collision Theory; Factors affecting rates of chemical reactions; Characteristics of catalysts; Order of reaction
	Unit 3: Energy and Chemical Reaction	Free Energy Change ΔG ; Equilibrium in chemical reactions; Le Chatelier's principles; Equilibrium constant; Change in free energy

COMPUTER STUDIES

COURSE TITLES & CODES (Modules)	COURSE UNITS	Course Contents/Descriptions
STAN CPS 106: Computer and Society (Module 6) (PRIMARY)	Unit 1: Computer Ethics	Ways of taking care of computer room/laboratory; rules and regulations of computer laboratory; Responsible use of computers and internets. Computer misuse and data security
	Unit 2: Computer in Education and Health	Uses of computers in education; Applications of computers in diverse fields of life e.g. health, Agriculture etc
	Unit 3: Safety Measures	Necessary safety measures to be taken when using computers e.g. sitting posture, anti-glare protectors, illumination of the room, keeping liquid away from computers and power source etc.
	Unit 4: Human Issues	Computer professionals; Computer professional bodies (Nigerian Computer Society (NCS), Institute of Management and Information Systems (IMIS); Computer Professional Registration Council of Nigeria (CPRN); Information Technology Association of Nigeria (ITAN); Nigerian Internet Group (NIG)
	Unit 5: Computer Viruses	Meaning of computer Viruses; Types of computer viruses (Boot sector virus, execution file virus etc); Examples of computer viruses (Trojan horse etc); Harmful effects of computer viruses; control of computer viruses
STAN CPS 204: Computer Problem Solving Skills (Module 4) (SENIOR SECONDARY)	Unit 1: Programming Language	Meaning of computer program; computer programming language (meaning, examples – logo, BASIC etc)
	Unit 2: BASIC	Meaning of BASIC language; BASIC character set; Key basic statements (line number, Remark -REM, Assignments – LET, INPUT, DATA, Output statements, print, program terminator (END, STOP); simple BASIC statements.

HOME ECONOMICS

COURSE TITLES & CODES (Modules)	COURSE UNITS	Course Contents/Descriptions
STAN HEC 106 The Kitchen, Cleaning Agents and Household Pests (Module Six) (PRIMARY)	Unit 1: Kitchen Hygiene	Meaning and importance of Kitchen hygiene. Maintaining kitchen hygiene. Cleaning of various surfaces in the kitchen.
	Unit 2: Household Pests	Meaning and types of household pests. Effects of household pest in the home. Prevention and control of household pest in the home.
	Unit 3: Cleaning Agents	Meaning and types of cleaning agents. Home made polish and cleaning agents. Uses of home made polish and cleaning agents. Preparation of home made polish and cleaning agents.
STAN HEC 206 Home Economics Project (Module Six) (JUNIOR SECONDARY)	Unit 1: Cosmetics	Meaning and types of cosmetics. Materials and tools for cosmetic production. Cosmetic production (pomade and cream).
	Unit 2: Household Crafts	Meaning of household craft, Tools and materials for making of crafts items. Making of craft items e.g. needle-work, bag and aprons etc.
	Unit 3: Fibre and Fabrics	Manufacture of fabric Fibre and fabric identification methods. Uses of fabrics.
	Unit 4: Garment Construction	Garment construction processes. Facings hemming, opening (fastening) practical. Practical on garment construction.
STAN HEC 306 Housing the Family (Module Six) (SENIOR SECONDARY)	Unit 1: The family House	Importance, types and functional areas. Choosing family house. Setting up a home.
	Unit 2: Interior decoration and maintenance	Meaning and importance of interior decoration. Maintenance and care of the home. Cleaning equipment, tools and cleaning agents. Simple home maintenance and repairs. Sanitation in the home
	Unit 3: Utilities and Safety Measure in the home	Types of utilities and likely risk associated in the use. Safety precautions.

MATHEMATICS

COURSE TITLES & CODES (Modules)	COURSE UNITS	Course Contents/Descriptions
STAN MAT 102 Basic Operations (Module Two) (PRIMARY)	Unit 1: Basic Operations I	Addition and subtraction of whole numbers and fractions using practical approach. Finding missing number in a given statement. Addition and subtraction of numbers with or without renaming. Use of fraction boards in teaching addition and subtraction of fraction. Word problems including quantitative reasoning. Solve problems requiring quantitative reasoning involving addition and subtraction of whole numbers, fractions, and decimals. Multiplication and division of whole numbers, fractions and decimals. Solution of quantitative aptitude problems involving multiplication and division of whole numbers, fractions and decimals. Calculation of squares and square roots of numbers
	Unit 2: Basic Operations II	Using concrete materials to teach LCM and HCF. Estimation. Indices. Ratio and percentages. Ratio and population issues; and order of operations. Demonstration of understanding of the content of LCM and HCF, estimation, indices, ratio and percentages. Ratio and population issues and order of operations as well as prepare and present a model lesson on each of the contents by the trainee teachers.
STAN MAT 204: Everyday Statistics (Module Four) (JUNIOR SECONDARY)	Unit 1: Everyday Statistics I	Discussion on purpose statistics can serve. Need for collecting data for prediction purposes. Need for collecting data for analysis purpose; Collection of data. Numerical presentation in any order. Ordered presentation of data in lists or table. Pictorial presentation of data using pictogram, bar chart or line graph. Frequency tables, pictograms, bar charts and pie charts. Identification of mode and median in a set of data. Calculation of mean.
	Unit 2: Everyday Statistics II	Discussion on occurrence of chance in everyday life. Practically determining the probability of certain events.
STAN MAT 302: Algebraic Processes (Module Two) (SENIOR SECONDARY)	Unit 1: The consumer and Principles of consumer education	Meaning and importance of consumer. Consumer agents. Principles of consumer education.
	Unit 2: Consumer rights, Information and Legislation	Rights and responsibilities of the consumer. Meaning and forms of consumer information. Consumer legislation.
	Unit 3: Consumer agents, Purchasing and management	Meaning and types of consumer agents. Environmentally friendly consumption. Wise purchasing practices. Market survey and prevention of waste in the home.

PHYSICAL AND HEALTH EDUCATION

COURSE TITLES & CODES (Modules)	COURSE UNITS	Course Contents/Descriptions
STAN PHE 106 Introduction to Directions, Exploration of Environments and Recreation (Module Six) (PRIMARY)	Unit 1: The Four Cardinal Points	Identification of the four cardinal points – the North, South, East and West. Importance of cardinal points to physical education teachers e.g. sitting and construction of 400m track
	Unit 2: Living and non living components of the environment	Identification of the living and nonliving components within our surroundings. The importance of living things to mankind within the environment.
	Unit 3: Recreation	Definition/Meaning of recreation. Types of recreational activities. Importance of recreational activities to mankind within the environment.
	Unit 4: Camping	Definition/Meaning of camping. Camping activities e.g. sharing responsibilities; recording of events; self evaluation;. The objectives of camping.
STAN PHE 206 Food, Nutrition and Health. (Module Six) (JUNIOR SECONDARY)	Unit 1: food	Meaning and classes of food. Different types of food. Importance of food to man (for energy, growth etc).
	Unit 2: Health and nutrition	Nutrition for special groups e.g. adolescents, athletes, sick, convalescents etc Diseases associated with nutritional deficiencies. And symptoms. Prevention of communicable diseases
STAN PHE 306 Games and Traditional Sports (Module Six) (SENIOR SECONDARY)	Unit 1: Games	Ball games (basketball, handball.). Specification of courts and pitches. Types of equipment used. Team formation and playing strategies.Racket games (Table tennis, Tennis. Specifications of courts, equipment used and regulations. Tactics and strategies for the games services in each game and officiating.
	Unit 2: Traditional sports	Historical development of sports in West Africa. Significance of traditional sports. Types of traditional sports e.g. Boat regatta, Dambe, Ebola, Sharo, Wrestling, Langa etc.

PHYSICS

COURSE TITLES & CODES (Modules)	COURSE UNITS	Course Contents/Descriptions
STAN IPHY 306 Fields at Rest and in Motion (Module Six) (SENIOR SECONDARY)	Unit 1: Charges, Description and properties of fields	
	Unit 2: Gravitational, Electric fields	Gravitational forces between two masses; escape velocity; electric forces between point charges; concepts of electric fields, electric field intensity and electric potential; capacitance (definition, arrangement of capacitors in a circuit, energy stored in a charged capacitor) production of continuous charges; electric circuit series and parallel arrangement of cells and resistors; shunts and multipliers; resistivity and conductivity; principles of potentiometer; measurements of electric current, potential difference, resistance and e.m.f of cells; electric production through liquid and gases
	Unit 3: Magnetic and Electromagnetic fields	Concept of magnetic fields; magnetic field around (i) a permanent magnet, (ii). A current carrying conductor, (iii). A solenoid; Magnets (types and production); Applications of electromagnetic fields; Earth's magnetic field; magnetic force on a moving charge. Concept of Electromagnetic field; interactions between magnetic fields and currents; applications of electromagnetic fields (electric motor, moving coil galvanometer); electromagnetic induction (Faraday's law, Lenz's law, motor generator effect, generators, induction coil transformer and power transmission) Applications of electromagnetic field
	Unit 4: Simple A.C. Circuits	Alternating currents circuits (nomenclature in Ac circuits, peak and r.m.s values, series circuits containing resistance inductance and capacitance, reactance and impedance); Power in ab a.c circuit

TECHNOLOGY EDUCATION

COURSE TITLES & CODES (Modules)	COURSE UNITS	Course Contents/Descriptions
STAN AEL 301 Battery (Module One) (SENIOR SECONDARY)	Unit 1: Concept and Uses of Battery	Motor Battery and primary cell battery. Uses of motor battery. Inspection of motor battery and other batteries. Battery as a power source in soldering.
	Unit 2: Types, Construction and Testing of Battery	Types of battery. Battery assemblies in a vehicle. Different types of secondary cell. Similarities and differences between them. Battery construction processes. Specific gravity test of electrolyte. Cell voltage test. Polarity test
	Unit 3: Maintenance of Battery	Maintenance of batteries – electrolyte topping up needs, hydrometer reading and interpretation, overcharging symptoms, idle battery safe-keeping units
	Unit 4: Battery Charging	Battery charging processes – preliminaries, acid mixing, battery cleaning, battery connection. Charging mode. State of charge. Electrolyte testing. State of charge.
STAN AUM 302 Engine system & Maintenance (Module Two) (SENIOR SECONDARY)	Unit 1: Main Components and Maintenance	The engine. Brakes. Steering. Light. Tyres. Suspension. Fuel system. Electrical system. Maintenance through lubrication services. Lubrication points. Engine tuning. Wheel bearing adjustment. Principles of four stroke cycles – ignition, compression, power and exhaust (petrol and Diesel). Basic principles of two stroke cycle – upward and downward strokes (petrol and Diesel).
	Unit 2: Cooling Systems	Conduction, convection and radiation. Low, normal and high temperature requirements. Effects of engine temperature on engine performance and failures. Engine knock. Apparatus of air-cooling system. Apparatus of water-cooling system. Layout of water and air-cooling systems. Advantages and disadvantages of the types of air and water-cooling systems.
	Unit 3: Crank Arrangement (Crankshaft configuration)	Crankshaft of 4 and 6 cylinders in-line engines. Crankshaft of v6 and v8 cylinder horizontally opposed engines. Crankshaft layout.
	Unit 4: Fuel, Exhaust and Firing order	Petrol and diesel. Properties of petrol and diesels. Functions of the exhaust system. The main components of the exhaust system. Effects of leak on the exhaust system. Functions and operations of ignition system. Factors that influence correct timing (spark plug gap, engine roam and load etc). Firing orders
	Unit 5: Lubrication and Greasing	Reasons for lubrication system. Types of gear and motor oil. Properties of engine oil and gear oil. Forms and types of lubrication systems. Uses of lubrication. Parts needing lubrication. Lubrication diagnosis and services to be carries out.
	Unit 6: Valve Operation Mechanism	Functions of valve operating mechanism. Main components of valve operating mechanism. Valve timing.
STAN BEL 303 Power Supplies and Electricity Generation/Transmission and Distribution (Module Three) (SENIOR SECONDARY)	Unit 1: Converters & Rectifiers	Power supply converter and inverters. Ac to DC. Rectification and filtration. Types of rectifier circuits. Verification of rectification process.
	Unit 2: Electricity Generation and Transmission	Concept of electricity generation. Types of generating stations. Advantages and disadvantages of various generating stations. Transmission of electricity. Methods of transmission of electricity. Functions of the main components of transmission system. Layout of transmission of electric power.
	Unit 3: Distribution of Electricity & Energy Conversion	Basic concept of electric distribution. Layout and main components. Functions of substations, transformers, distributors and feeders. Field trip to energy stations. Energy types, conversion and relationships between types.
STAN ELT 302: Basic Electricity theory and Thermionic devices (Module Two) (SENIOR SECONDARY)	Unit 1: Electromagnetism	Electromagnetism - explanation, applications, and principles of operation of transformers.
	Unit 2: Electron Emission	Electron emission (thermionic, photo, secondary & field emissions). Applications
STAN FAW 306 Surface & Environmental Factors (Module six) (SENIOR SECONDARY)	Unit 1: Welding Environment	Chemical environment. Flammable environment. Environmental effects on welded metals. Environmental effects on fabricated material. Welding in chemical or highly inflammable environment. Safety precautions for welding in chemical and inflammable environments.
	Unit 2: Surface operations	Pre fabrication surface operation. Post fabrication surface operation. Pre welding surface operation. Post welding surface operation. Welding surface defects (causes and remedies)
	Unit 3: Welding Dissimilar Metals	Dissimilar metals that can be joined. Selection of types of currents for joining dissimilar metals. Selection of filter rods for dissimilar metals.
STAN MTW 306 Heat Treatment and Forging (Module Six) (SENIOR SECONDARY)	Unit 1: Heat Treatment	Importance of heat treatment (importance of annealing, normalizing, hardening, case hardening, tempering. Materials and equipment for heat treatment of metals. Heat treatment processes. Tempering colour and temperature ranges.
	Unit 2: Forging	Principles of forging. Definition of forging. Importance of forging. Types of forging. Forging tools and equipment. Sketching of common forging tools and equipment. Forging operations.
STAN MTW 306 Heat Treatment and Forging (Module Six) (SENIOR SECONDARY)	Unit 1: Heat Treatment	Importance of heat treatment (importance of annealing, normalizing, hardening, case hardening, tempering. Materials and equipment for heat treatment of metals. Heat treatment processes. Tempering colour and temperature ranges.
	Unit 2: Forging	Principles of forging. Definition of forging. Importance of forging. Types of forging. Forging tools and equipment. Sketching of common forging tools and equipment. Forging operations.

Provisional Conference Programme

Saturday 12 August 2017 Principal Officers arrive
Sunday 13 August 2017 Pre-Conference Planning Committee Meeting
 Pre-Conference Press Release
Monday 14 August 2017 Members of the Executive Board Arrive

9.00am Conference Registration Begins
 4.00pm Executive Board Meeting
 8.00pm Dinner

Tuesday 15 August, 2017

9.00am Conference Registration Continues
 9.00am Courtesy call on Governor
 2.00pm Lunch
 3.00pm Review of WAEC and NECO Chief Examiners' Reports
 4.30pm **Opening Ceremony**
 - National Anthem
 - Introduction of Dignitaries
 - Address of Welcome by Head of Institution
 - STAN President's Address
 - Short Cultural Show
 - Goodwill Messages
 - Address by the Minister of Education
 - Address by Executive Governor and Declaration of Conference Open
 - Vote of Thanks by the Conference Chair
 - Group Photographs
 - Opening of Science Fair and Exhibition by the Executive Governor
 8.00pm Dinner

Wednesday 16 August, 2017

8.00-11.00am Educational Visits
 9.00-10.30am Plenary Session 1: Keynote Address
 9.00-6.00pm Science Project/Quiz
 10.30-11.00am Visits to Exhibitions Stands
 11.00-11.30am Break
 11.30-1.00pm Special Lecture
 1.00-2.00pm Launching of New STAN Publications
 2.00-3.00pm Lunch
 3.00-4.00pm **Subject Panel Meetings (Paper Presentation)**
 - Basic Science
 - Home Economics
 - ICT
 - Workshops
 4.00-4.30pm Break
 4.30-6.00pm **Board of Fellows Meeting**
 Subject Panel Meetings (Paper Presentation)
 - Environmental Education
 - Gender & STME
 - Science-Technology-Society
 - Teacher Education
 Special Lecture
 Workshops

Thursday 17 August, 2017

8.00-11.30am Educational Visits
 9.00-11.00am **Subject Panel Meetings (Paper Presentation)**
 - Agricultural Science
 - Biology
 - Chemistry
 - Mathematics
 - Physics
 - Physical & Health Education
 - Special Lecture
 - Workshops
 11.00-11.30am Break
 11.30-1.30pm Memorial Lecture
 Workshops
 2.00-3.00pm Lunch
 3.00-4.00pm **Subject Panel Meetings-(Business)**

- Environmental Education
 - Gender and STME
 - Teacher Education
 - Basic Science
 - Science-Technology-Society
 - Basic Science & Technology
 - Home Economics
 - ICT
 - Break
 4.00-4.30pm
 4.30-6.30pm
Symposium
 Special Meetings
Workshops
 Subject Panel Meetings - (Business)
 Agricultural Science
 Biology
 Chemistry
 Mathematics
 Physics
 Technology Education
 Physical & Health Education
 6.30-8.00pm **Governing Council Meeting**
 8.00pm Dinner

Friday 18 August, 2017

8.00-11.30am Educational Visits
 9.00-11.30am Contributed Papers to the Sub-themes Meeting of Subject Panel Officers with Curriculum Development Co-ordinator; Science Fair Co-ordinators' Meeting
 Editorial Board Meeting
 11.30-12.00noon Break
 1.00-3.00pm Annual General Meeting
 4.00-6.00pm Science Quiz Finals
 6.00-7.00pm Awards
 - Science Projects & Quiz Prizes
 - Mamman Wasagu Award
 - Eunice Okeke Award
 - Ivowi Award for Best Conference Paper
 - STAN-Napoleon Bryant Award
 - State Branch of the Year Award
 - DSSE Award
 - Honorary FSTAN Award
 - FSTAN Award
 8.00-1.00pm Annual Dinner

Saturday 19 August, 2017

6.00-8.00am Departure of Delegates
 2.30-4.00pm Post Conference Planning Committee Meeting

Notice of 58th Annual General Meeting

Date: Friday 18 August, 2017
Time: 1.00pm
Venue: Ignatius Ajuru University of Education, Port Harcourt, Rivers State
Election: Vice President, General Secretary, Curriculum Development Coordinator

*Special Items on the Conference Programme

- a. **STAN Science Projects/Quiz Competitions**
The National theme for projects is “Sewage Management”. There will also be competitions in the free choice category. Oral and written presentations (3 copies) will be required. In the quiz competitions, questions will cover up to the SSII Curriculum in Agricultural Science, Biology, Chemistry, Computer Studies, Home Economics, Mathematics (General/Further), Physical and Health Education, Physics, and Technology. SSIII students are not to participate in the competitions. Each State is to present a maximum of 4 students - 2 for quiz and 2 for project.
- b. **Primary Science Projects/Quiz Competitions**
These competitions will take place among primary school pupils who should please be fully supported to the conference by State Universal Basic Education Boards. Each State is to present a maximum of four pupils (two for quiz, and two for projects).
- c. **STAN Fellowship Award**
Dr. Maria Eko, Dr. Gladys Charles-Ogan, Mr. Samson Oladeji, Prof. Agaptus Orji, Mr. Joseph Udo and Mr. Benson Ugwoke will receive the FSTAN Award on Friday 18 August, 2017. Don't miss the session.
- d. **Branch of the Year Award**
This Award will be made to the best five branches of STAN in 2017. The ceremony is scheduled for Friday 18 August, 2017 at 6.30p.m. Please be there.
- e. **Mamman Wasagu Award**
This Award will be made to the state with the highest membership registration in 2017 on Friday 18 August, 2017 at 6.00p.m.
- f. **Eunice Okeke Award**
This Award will be made to the state with the highest conference registration in 2017 on Friday 18 August, 2017 at 6.00p.m.
- g. **Uduogie Ivowi Award for the Best Conference Paper**
This Award will be made to the 2017 recipient on Friday 18 August, 2017 at 6.00p.m.
- h.. **STAN-Napoleon Bryant Award**
This Award will be made to the best science teacher in 2017 and the best senior secondary student in the quiz competition. All Branch Chairs are expected to submit entries on or before 7 July 2017.
- i. **Members' Exhibition and Poster Session**
There will be opportunity for science teachers to exhibit teaching materials and posters which they have personally Made

60th Anniversary Conference Charges

Annual Conference Registration	= N7,300.=
Dinner (Mandatory for members of Governing Council)*	= N5,000 .=
Feeding at Conference Venue (18 meals)**	= N2,700.=
Total	=N15,000.=

* This is payable at the conference venue only

** Please don't pay this into STAN account. Participants are to keep it for their feeding.

Why you should attend this Conference

- * Because the conference theme focuses on “STEM and Society”
- * Because it is a forum for exchange of views among STEM teachers from Nigeria and many overseas countries.

DRESS CODE AT ANNUAL DINNER

Ladies: Black suit with white blouse/any all-white national dress

Gentlemen: Black lounge suit with white shirt and black bow tie/Any all-white national dress

DEADLINES

- 28 April, 2017:** Deadline for submission of conference papers
- 16 June, 2017:** Deadline for submission of Branch reports by State Chairs
- 7 July, 2017:** Deadline for entries for STAN President's Award and Branch of the Year Award
- 14 July, 2017:** Deadline for receipt of intention to contest for the following positions: **Vice President, General Secretary, Curriculum Development Co-ordinator**

For further information, please contact:

Patience Onochie
Principal Administrative Officer
Science Teachers Association of Nigeria
The STAN Place, Kwali,
P.M.B. 777 Garki, Abuja.
Tel: 0708 274 3110, 0805 196 9227
Website: www.stanonline.org
Email: stan.headquarters@gmail.com

OR

Mrs. Ibifri Blessing Pollyn
Conference Secretary
0813 122 9705

Mr. Ebenezer Oporum Amadi
Conference Chair
0807 558 8643

Dr. Joseph Ukonu
Publicity Secretary
0803 723 9812