

STUDENTS WORKLOAD AND COURSE DESCRIPTION (FIRST SEMESTER M. AgSE IN AGRICULTURAL ECONOMICS AND ENVIRONMENTAL POLICY PROGRAM)

ADVANCED MICROECONOMICS					
Module code	Student workload	Credits	Semester	Frequency	Duration
AES 801	180 hours	6.0 ECTS	1 st . Sem.	Each First Semester	15 Weeks
1	Types of courses		Contact hours	Independent study	Class size
	a) Class Work b) Seminars c) Students' Presentation		45 hours	135 hours	Avg of 20 (Max 40)
2	Prerequisites for participation				
	a) Participation in the course is compulsory for all students admitted for M.AgSE b) Participation is subject to confirmation of student's registration for the course c) Students are expected to have elementary knowledge of principles of microeconomics				
3	Learning outcomes				
	Knowledge outcomes				
	After studying all materials and resources in this course, the students will be able to learn the fundamental methods and theories of microeconomics and be provided with the basic tools and concepts required to understand scientific papers at the research frontier of microeconomic theory.				
	Specifically, students will be able to:				
	a) have understanding of basic microeconomic analytical tools and their applications in agriculture; b) have a thorough understanding of the underlying theory and grasp the methods to study problems relating to the behaviour of individual agents (consumers, business firms, and investors) and their interaction through markets and other social institutions; c) be able to bridge theory with empirical implementation; d) understand price theory, theory of consumer behaviour, theory of production & costs with emphasis on their applications in agriculture; e) comprehend the analytical procedures and empirical techniques used in consumer demand; f) have the basic knowledge of Partial and General equilibrium analysis; g) understand the fundamentals of welfare economics. Poverty, income inequality; h) be able to analyse discrimination and gender issues in development. i) market based and social policies for enhancing social inclusion and sustainable development				
	Skills Outcomes				

	<p>The students will be able to read and understand scientific papers representing the research frontier of microeconomic theory.</p> <p>a) to read scientific articles in the fields of economics, finance and management science while understanding the role of invoked microeconomic assumptions and the references to standard microeconomic results;</p> <p>b) to formulate a microeconomic research question by structuring it as a formal model;</p> <p>c) manage to obtain useful economic predictions through the use of mathematical tools and a sound economic intuition;</p> <p>d) identify central measurable parameters, necessary for operationalizing microeconomic models.</p>
4	<p>Subject aims</p> <p>The module is designed to be an upper-level in agricultural microeconomic theory to deepen student knowledge in topics such as consumer and producer theory, game theory, labor and capital markets, externalities, and public goods. The course is more algebra intensive than an introductory-level microeconomics courses.</p> <p>Course Contents</p> <p>Students will learn the following contents:</p> <p>a. Micro statistics and Microeconomics theory</p> <p>b. Tools of economic analysis</p> <p>c. Price and distribution theory</p> <p>d. Theory of production and theory of consumer behaviour & costs with emphasis on applications in agriculture;</p> <p>e. Factor market equilibrium and the exchange economy</p> <p>f. General equilibrium analysis;</p> <p>g. Fundamentals of welfare economics.</p>
5	<p>Teaching methods</p> <p>Lectures, sharing of materials via learning tools, global scenarios technique, case studies, group work, individual presentations, and discussions</p>
6	<p>Assessment methods</p> <p>Individual Presentations, Group Assignments, Continuous Assessment, Summative Assessment, Written end-of-the-semester examination</p> <p>This course will be graded as follows: Individual Presentation 5%, Group Assignments 5%, Test(s) 20% Final Examination 70%</p>
7	<p>This module is used in the following degree programmes as well</p> <p>N/A</p>
8	<p>Responsibility for module</p> <p>· Dr. Obayelu Abiodun Elijah</p>

9 Other information

Suggested References

- Adegeye, A. J. and Dittoh J. S (1985).Essentials of Agricultural Economics. Published by Impact Ltd Ibadan, Nigeria.
- Barkley, A. and P. W Barkley (2016). "Principles of Agricultural Economics. Routledge; 2 edition (March 18, 2016).
- Besanko, D. A., Braeutigam R. R and M. Gibbs (2011). Microeconomics. Fourth Edition, John Wiley & Sons, Inc
- Colman, D.and T. L. Young (1989): "Principles of Agricultural Economics: Markets and Prices in Less Developed Countries". Cambridge University Press, New York
- Dewett, K .K. (1976)."Modern Economic Theory : Micro and Macro Analysis. Orient Book Distributors, Dewett, K .K. (1976)."Modern Economic Theory : Micro and Macro Analysis. Orient Book Distributors, New Delhi.
- Debertin, David L. (2012). "Applied Microeconomics: Consumption, Production and Markets". CreateSpace Independent Publishing Platform
- Gilboa, I. (2009): Theory of Decision under Uncertainty, Econometric Society Monographs 45, Cambridge: Cambridge University Press
- Garcia F. M, (2017). Advanced Microeconomic Theory: An intuitive Approach with examples. Published August, 2017
- GoolsBee, A., Lecitt, S., Syverson C. (2013). Microeconomics: 1st International Edition
- Geoffrey, A. Jehle and Philip J. Reny (2011). Advanced microeconomic theory. Pearson Education Limited.
- Kreps, D. (2013): Microeconomic Foundations I: Choice and Competitive Markets, Princeton University Press
- Mas-Colell, Andreu, Michael D. Whinston and Jerry R. Green (1995): Microeconomic Theory, Oxford University Press: New York and Oxford
- Nicholson, W. and C. Snyder (2012). Intermediate Microeconomics and Its Applications. Eleventh Edition. Cengage Learning.
- Nourse, E.G.(2017). "Agricultural Economics: A Selection of Materials in Which Economic Principles Are Applied to the Practice of Agriculture". CHIZINE PUBN. 930pp
- Olayemi J. K (2004): Principles of Microeconomics for applied economic analysis.Published bi SICO publishers, Ibadan, Nigeria
- Perloff J. M. (2013). Microeconomics: Theory and Application with Calculus
- Ritson, C. (1977)."Agricultural Economics: Principles and Policy". Published by Palgrave Macmillan
- Samuelson, P. A (2013). Microeconomics. McGraw-Hill, New York
- Varian H. R. (1992). Mlcroeconomic analysis. Third Edition, Published by W. W. Norton & Company, USA

Note:

This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations,

and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent.

ADVANCED MACROECONOMICS					
Module code	Student workload	Credits	Semester	Frequency	Duration
AES 802	180 hours	6.0 ECTS	Second Semester	One time in each second Semester	15 Weeks
1	Types of courses a) Class Work b) Seminars c) Students' Presentation	Contact hours 45 hours	Independent study 135 hours	Class size Avg of 20 (Max 40)	
2	Prerequisites for participation a) Participation in the course is compulsory for all students admitted for M.AgSE b) Participation is subject to confirmation of student's registration for the course c) Students are expected to have elementary knowledge of principles of macroeconomics				
3	Learning outcomes				
	Knowledge outcomes After studying all materials and resources in this course, the students will be able to: a) explain the circular flow of income and expenditure in the simplest economy made up of only two sector, three sector and four sector economy; the importance of the circular flow of income/spending b).explain the concepts of aggregate consumption and savings; explain the basic consumption and saving function; the consumption hypothesis and the various theories of consumption function c) define investment and capital; the accelerator theory of investment d). define inflation, types, causes, measurement, effects and measures to curb inflation e) Public debt and the implications f) understand the differences between Keynesian/New Neoclassical framework and their implication for monetary policy g). analyse unemployment, types of unemployment, measurements as well as the causes of unemployment with reference to Nigerian economy and policy measures to fight unemployment h) discuss the concept of the Philips curve and the basic tenets of the Philips curve i) explain the concept of economic growth, economic growth and inequality, economic growth-developed and developing economies explain business cycles j) explain equilibrium in the goods or product market, equilibrium in the money market, general equilibrium				
	Skills Outcomes				

	<p>a) The students will be able to read and understand scientific papers representing the research frontier of macroeconomic theory.</p> <p>b) Read the newest and most advanced research literature in macroeconomics;</p> <p>c) to formulate a macroeconomic research question and apply tools of dynamic analysis in research.</p> <p>d) manage to obtain useful economic predictions through the use of mathematical tools and a sound economic intuition;</p> <p>e) identify central measurable parameters, necessary for operationalizing macroeconomic models.</p>
4	<p>Subject aims</p> <p>The module is designed to be an upper-level in macroeconomic theory to deepen student knowledge in topics such as consumption saving and investment theory. The course will introduce and develop a number of new and contemporary topics and issues in macroeconomics, enhance the macroeconomic knowledge of students and to improve their techniques of decision making, further develop understanding of macroeconomic theory and, where appropriate, integrate this theory with issues of current policy interest and develop students' analytical and problem solving abilities applied to economic principles.</p> <p>Course Contents</p> <p>Students will learn the following contents:</p> <p>a. Aggregate consumption, saving and investent theory</p> <p>b. Circular flow of income and expenditure</p> <p>c. National income determination</p> <p>d. Cassical price level determination</p> <p>e. wage price dynamics: and growth theories</p> <p>f. Keynesian employment, inflation and public debt</p> <p>g. Business cycles and macroeconomic policy</p> <p>h. Essential macroeconomic tools;</p> <p>i. Role of nominal frictions within a New Keynesian/New Neoclassical framework and their implication for monetary policy;</p>
5	<p>Teaching methods</p> <p>Lectures, sharing of materials via learning tools, case studies, group work, individual presentations, and discussions</p>
6	<p>Assessment methods</p> <p>Teaching and learning will be conducted through weekly lectures, assigned readings and discussion seminars. The students will be provided with challenging and thought-provoking assignments.</p> <p>Individual Presentations, Group Assignments, Continuous Assessment, Summative Assessment, Written end-of-the-semester examination</p> <p>This course will be graded as follows: Individual Presentation 5%, Group Assignments 5%, Test(s) 20% Final Examination 70%</p>

7	<p>This module is used in the following degree programmes as well</p> <p>N/A</p>
8	<p>Responsibility for module</p> <p>· Dr. Obayelu Abiodun Elijah</p>
9	<p>Other information</p> <p>Suggested References</p> <p>Auerbach, A. J. and Kotlikoff, L. J. (1998). <i>Macroeconomics: An Integrated Approach</i>. MIT Press.</p> <p>Blanchard, O. (2009). The State of Macro. <i>Annual Review of Economics</i>, 1, 209–228</p> <p>Blanchard O. J. and S. Fisher (1989): <i>Lectures on Macroeconomics</i>, The MIT Press, 1989</p> <p>Benassy J. P.(2011): <i>Macroeconomic Theory</i>, Oxford University Press.</p> <p>Carlin, W. and Soskice, D. (2015). <i>Macroeconomics: Institutions, Instability and the Financial System</i>. Oxford University Press.</p> <p>Cooley, Thomas F. and Edward C. Prescott. 1995. "Economic Growth and Business Cycles." Chapter 1 of Cooley (ed.) <i>Frontiers of Business Cycle Research</i></p> <p>Chari V. V., P. J. Kehoe and E. R. McGrattan (2007): "Business Cycle Accounting", <i>Econometrica</i>, 75, 781-836</p> <p>Dornbusch, R., S. Fischer and R. Startz (2011): <i>Macroeconomics</i>. New York: McGraw-Hill</p> <p>de la Croix, D. and Michel, P. (2002). <i>A Theory of Economic Growth: Dynamics and Policy in Overlapping Generations</i>. Cambridge University Press</p> <p>Harcourt, C.G. (2006). <i>The Structure of Post-Keynesian Economics. The Core Contribution of the Pioneers</i>. Cambridge: Cambridge University Press</p> <p>Fine, B., Dimakou, O. (2016). <i>Macroeconomics. A critical companion</i>. London: Pluto Press</p> <p>Ljungqvist, L. and T.Sargent (2000). <i>Recursive Macroeconomic Theory</i>, MIT Press</p> <p>Mankiw, N. G, (2010). <i>Macroeconomics</i>, Worth Publishers, 7th edition</p> <p>Mailafia, D.I. (2010): <i>Understanding Economies: An Introduction to Economic Theories, Principles and Applications</i>. (2nd ed.). Ikeja-Lagos: Data Quest Publishers.</p> <p>Romer, D. (2016): <i>Advanced Macroeconomics</i>, McGraw-Hill/Irwin</p> <p>Taylor, L. (2004). <i>Reconstructing macroeconomics: Structuralist proposals and critiques of the mainstream</i>. Cambridge, MA: Havard University Press</p> <p>Wickens, M (2012). <i>Macroeconomic Theory: A Dynamic General Equilibrium Approach</i>, Princeton University Press, 2nd Ed.</p> <p>Williamson, S. (2011). <i>Macroeconomics</i>. Addison-Wesley Publishers.</p>

<p>Important Note:</p> <p>This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote about 180 hours to learning of the course content, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using econometric software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent.</p>

STATISTICAL THEORY AND ANALYSIS						
Module Code	Student workload	Credits (according to ECTS)	Semester	Frequency	Duration	
AES 803	180 hours	6.0	First Semester	Once every academic session by the First Semester	15 Weeks	
1	Types of courses a) Class Work b) Hands-on Practical c) Students' Presentation	Contact hours 45 hours	Independent study 135 hours	Class size Avg of 20 (Max 40)		
2	Prerequisites for participation Basic knowledge of statistics, mathematics and research methods at the undergraduate level					
3	Learning outcomes After the completion of this course, the Students will: a) Understand the foundational concepts, principles and theories of probability and statistics including probability distributions, sampling distributions and the link to statistical estimation and hypothesis testing (parametric and non-parametric). b) Be able to apply various statistical tools in research data analysis and interpretation of results					
4	Subject aims The aim of the module is to 1. Equip students with sound knowledge of the theoretical foundations of statistical estimation and decision analyses. 2. Build students' practical skills in the design and implement statistical inquiry, including data analysis, statistical estimation, hypothesis testing and interpretation of results. Course Contents					

	Sets and Probability, random variable and probability distributions, expectations, variance, moments and moment generating functions, special probability distributions, sampling theory and methods, Chebyshev's inequality, law of large numbers, central limit theorem, estimation theory, hypothesis testing (parametric & non parametric), analysis of variance, correlation and regression methods. Hands-on experience using Statistical Software in Data Analysis.
5	Teaching methods Lectures, practical demonstrations, sharing of materials via learning tools, case studies, group work, individual presentations, and discussions
6	Assessment methods Individual Presentations, Group Assignments, Continuous Assessment, Summative Assessment, Written end-of-the-semester examination Assignments & Presentations (15%), Mid-Semester Tests (15%) and Final Examination (70%)
7	This module is used in the following degree programmes as well M. Agric. (Agricultural Economics)
8	Responsibility for module Prof. Adebayo M. Shittu and Dr Shakirat B. Ibrahim
9	Other information 1. References a) DeGroot, M.H. and Schervish, M.J. (2012). <i>Probability and statistics</i> 4th ed., Pearson Education, Inc., Boston. b) Field, A. (2013). <i>Discovering statistics using SPSS</i> (4th edition). Sage Publishing, Los Angeles. c) Schiller, J.J., Srinivasan, R.A. and Spiegel, M.R. (2013). <i>Schaum's Outline of Probability and Statistics</i> , 4th ed., McGraw-Hill, London. 2. Important Note This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent.

ECONOMETRIC METHODS						
Module Code	Student workload	Credits (according to ECTS)	Semester	Frequency	Duration	
AES 804	180 hours	6.0	Second Semester	Once every academic session by the second Semester	15 Weeks	
1	Types of courses	Contact hours	Independent study	Class size		

	a) Class Work b) Hands-on Practical c) Students' Presentation	45 hours	135 hours	Avg of 20 (Max 40)
2	Prerequisites for participation Basic knowledge of statistics, mathematics and econometrics at the undergraduate level			
3	Learning outcomes After the completion of this course, the Students will be able to: a) explain the foundational principles, theories and techniques of econometrics, and the application b) apply various econometric techniques in data analysis and interpretation of results using econometric software (open / commercial) like SHAZAM, Stata, and R.			
4	Subject aims The aim of the module is to: 1. expose students to the principles and applications of econometric techniques in socio-economic research; and 2. build students' practical skills in econometric modelling, data analysis and results' interpretation as well as presentation. Course Contents Purpose and Methods of Econometrics; The Classical Least Square Regression Methods; Specification Tests, Structural Breaks & Dummy Variables; Violations of Basic Least Square Assumptions: consequences, diagnosis and remedies. Maximum Likelihood, Generalised Least Square and Instrumental Variable Methods; Multiple Equation Models; Limited Dependent Variable Models.			
5	Teaching methods Lectures; practical demonstrations; assigned reading, critique and replication (hands-on practice using local data) of econometric analysis in published economic papers; presentations and discussions.			
6	Assessment methods Performance in the course will be assessed by a combination of assignments (10%), a Mid Semester Test (15%), a term paper (25%) and a final examination (50%). .			
7	This module is used in the following degree programmes as well M. Agric. (Agricultural Economics)			
8	Responsibility for module Prof. Adebayo M. Shittu and Dr Dare Akerele			
9	Other information 1. References Main Texts:			

	<ul style="list-style-type: none"> Adkins, L.C. and Hill, R.C. (2011). Using Stata For Principles of Econometrics, 4th ed., John Wiley & Sons, Inc, New York. Dougherty, Christopher. 2007. Introduction to Econometrics , 3rd Ed. New York: Oxford University Press. Hill, R.C., Griffiths, W.E. and Lim, G.C. (2011). Principles of Econometrics, 4th ed. John Wiley & Sons, Inc, New York. Johnston, J. and DiNardo J. (1997). Econometric Methods, 4th ed. McGraw-Hill, Singapore. <p>Supplementary Texts</p> <ul style="list-style-type: none"> Greene, W. H. (2012). Econometric Analysis, 7th ed., NJ: Prentice Hall (Pearson Educations, Inc.). Gujarati, D.N. (2003). Basic Econometrics, 4th ed. NewYork: McGraw-Hill Higher Education. Koutsoyiannis A. (2001). Theory of Econometrics, 2nd ed. Harmshare: Palgrave. <p>2. Important Note</p> <p>This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote about 180 hours to learning of the course content, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using econometric software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent.</p>
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AGRICULTURAL DEVELOPMENT					
Course code AES 805	Student work- Load	Credits (ECTS)	Semester First Semester	Frequency Each First Semester	Duration 15 weeks per semester
1	Types of Courses (a) Classroom lecture (b) Term paper presentation using projector	Contact 45 hours	hours	Independent study 135 hours	Class size Avg of 20 (Max 40)
2	<p>Prerequisites for participation:</p> <p>Participation in the course is compulsory for all students admitted for M.AgSE and PhD.SE</p> <p>Participation is also always subject to confirmation of student registration for the course</p> <p>Student is required to be taking the center language skills in the semester this course is taken</p>				

3	<p>Learning outcomes:</p> <p>After successfully completing this course, students should be able to:</p> <ul style="list-style-type: none"> • know the role of agriculture in economic growth and development of the developing nations • understand the nature and attributes of traditional/underdeveloped agriculture. • discuss agricultural growth and economic development in a globalized world. • provide a chart drawing a clear distinction between the concepts of agricultural growth and agricultural development. • understand the theories of agricultural and economic development, with assumptions and relevant models and critical appraisal. • know the required preconditions for agricultural development i.e. how to move from underdeveloped to developed agricultural economy. • establish the cultural, institutional and political impediments to progress in agriculture in developing countries. • discuss the evolutionary and radical/transformational approaches to agricultural development. • explain the concept, types and steps of agricultural development planning. • understand and explain the concept of cost-benefit analysis with special reference to private and public agricultural projects. • present and analyze the agricultural policies of their countries with a view to knowing what went wrong and why (historical treatment of governmental policies and programmes affecting agricultural policies in developing countries and need for suggestions for possible solution for agricultural development and sustainability)
4	<p>Course Contents</p> <p>Economic Growth and Economic Development: concepts, measurement and emerging issues including sustainability and wise use of ecosystem services. Agricultural growth and economic development; Models and theories of agricultural and economic development; approaches to agricultural development; Economic development with unlimited supplies of labour; impediments to progress in agriculture in developing countries; The Classical, Neoclassical and Endogenous growth models; Methods for analyzing costs and benefits of price supports, import restraints, and other policies for producers, consumers, and taxpayers.</p>
5	<p>Teaching methods:</p> <p>(a) Lectures (b) discussions (c) group presentation (d) case studies/practical exposure or field trip</p>
6	<p>Assessment methods:</p> <p>(a) The course is evaluated through various combinations of methods including final examinations, term papers oral presentations, individual study and group work</p> <p>(b) This course will be graded as follows: Class Attendance 5%, Assignments and Case Studies 15%, Test(s) 10% Final Examination 70%</p>
7	<p>This module/course is used in the following degree programme(s):</p> <p>PhD.SE and M.AgSE</p>
8	<p>Responsibility for module/course: Prof O. F. Ashaolu</p>

Other information e.g. references:

- (1) Allen V. K. (1995). Theoretical Problems in the Estimation of Benefits and Costs. Edward Elgar Publishing Ltd., Croft Rd, Aldershot, Hants GU11 3HR, U.K.
- (2) Fei, J.C.H. and Ranis G. (1986). Development of the Labour Surplus Economy: Theory and Policy. Publication of The Economic Growth Center, Yale University. 324p
- (3) Gustav Ranis (2000): Economic Growth and Human Development. *World Development* 28 (2): 197-219
- (4) Hagen, E.E. (1962). "A Framework for Analyzing Economic and Political Development" in Development of Emerging Countries (ed)
- (5) Harris, John and Michael Todaro. 1970. "Migration, Unemployment, and Development: A Two-Sector Analysis." *American Economic Review* 60: 126-142.
- (6) Jhingan, M.L.(2011): The Economics of Development and Planning. VRINDA publications (P) Ltd, Delhi, India. ISBN 978-81-8281-385-4
- (7) Jorgenson, D.W. (1967). 'Surplus Agricultural Labour and the Development of a Dual Economy', *Oxford Economic Papers*, 19 (3); 288–312.
- (8) Kaldor, Nicholas (1957) 'A Model of Economic Growth', *Economic Journal*, 67: 591-624.
- (9) Kuzents, S. (1955). "Economic Growth and Income Inequality". *American Economic Review*. Mar. 1955.
- (10) Lewis, W. A. (1954). Economic development with unlimited supplies of labour. *The Manchester School*, 22, 139-191.
- (11) Lipton, M. (1977). Why poor people stay poor: urban bias in world development. London: Temple Smith.
- (12) Rostow, W. W. (1960). "*The Five Stages of Growth-A Summary*". *The Stages of Economic Growth: A Non-Communist Manifesto*. Cambridge: Cambridge University Press. pp. 4–16.

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Important Note:

This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent.

AGRICULTURAL POLICY ANALYSIS					
Course code	Student work-load	Credits (ECTS)	Semester	Frequency	Duration
AES 806	180 hours	6.0 ECTS	Second Semester	One time in each second Semester	15 Weeks
1	Types of Courses	Contact	hours	Independent study	Class size

	(c) Classroom lecture (d) Term paper presentation using projector	45 hours	135 hours	Avg of 20 (Max 40)
2	<p>Prerequisites for participation:</p> <p>Participation in the course is compulsory for all students admitted for M.AgSE</p> <p>Participation is also always subject to confirmation of student registration for the course</p> <p>Student is required to be taking the center language skills in the semester this course is taken</p>			
3	<p>Learning outcomes:</p> <p>After successfully completing this course, students should be able to:</p> <ul style="list-style-type: none"> • know the general issues in agricultural development e.g. the roles of agriculture in economic growth and development. • understand the attributes of the traditional/underdeveloped agriculture. • present and analyze the agricultural policies of their countries with a view to knowing what went wrong and why (historical treatment of governmental policies and programmes affecting agricultural policies in developing countries and need for suggestions for possible solution for agricultural development and sustainability) • understand and explain the concept of cost-benefit analysis with special reference to private and public agricultural projects. • know the guiding principles of agricultural policies in decision making • understand the political economy of agricultural policies and why poor policy varieties get adopted • apply Cost-Benefit Analysis and Policy Analysis Matrix (PAM) as models to capture profitability and competitiveness of various production systems. 			
4	<p>Course Contents</p> <p>The role of Agriculture in economic development of developing countries. Policy interventions in the Food and Farm Sectors in Nigeria as well as other developing and developed countries including their motivations, policy instruments and consequences for factor owners and related commodity markets. Historical treatment of governmental policies and programmes affecting agricultural policies in developing countries; Issues of agricultural policy: Agricultural policy process in Africa, policy analysts and researchers, political economy of agricultural policies, policy varieties and environmental stress. Agricultural policies of developing countries and analysis with respect to key sub-sectors; agricultural policy objectives and strategies for implementation. Agricultural policies and food security; economic information needed for policy decisions. National rural development policy and guiding principles: small scale versus large scale farms. Policy distortions, subsidies and rural employment generation; Cost-Benefit Analysis and Policy Analysis Matrix (PAM) as models for policy options and decisions with special reference to private and public agricultural projects.</p>			
5	<p>Teaching methods:</p> <p>(e) Lectures (f) discussions (g) group presentation (h) case studies/practical exposure or field trip</p>			
6	<p>Assessment methods:</p>			

	<p>(a) The course is evaluated through various combinations of methods including final examinations, term papers oral presentations, individual study and group work</p> <p>(b) This course will be graded as follows: Class Attendance 5%, Assignments and Case Studies 15%, Test(s) 10% Final Examination 70%</p>
7	This module/course is used in the following degree programme(s): M.AgSE
8	Responsibility for module/course: Prof O.F. Ashaolu
9	<p>Other information e.g. references:</p> <ol style="list-style-type: none"> (1) Allen V. K. (1995). Theoretical Problems in the Estimation of Benefits and Costs. Edward Elgar P Guublishing Ltd., Croft Rd, Aldershot, Hants GU11 3HR, U.K. (2) Are L (1986) Agricultural policies and development in Nigeria: What went wrong? Development Outlook, An International Socio-Economic Development Magazine. Vol. 1 No. 1 pp 7-10. (3) Gustav Ranis (2000): Economic Growth and Human Development. <i>World Development</i> 28 (2): 197-219. (4) Idachaba, F.S. (2006). "Good Intentions are not Enough. Collected Essays on Government and Nigerian Agriculture Vol. 1: The Agricultural Policy Process. Univ. Press Plc, Ibadan. ISBN 978-030-958-6. Website: www.universitypressplc.com (5) Idachaba, F.S.(2006). "Good Intentions are not Enough. Collected Essays on Government and Nigerian Agriculture Vol. 2: Commodity Taxes and Farm Input Subsidies. Univ. Press Plc, Ibadan. ISBN 978-030-959-4. Website: www.universitypressplc.com (6) Idachaba, F.S.(2006). "Good Intentions are not Enough: Collected Essays on Government and Nigerian Agriculture Vol. 3: The Agricultural Research, Uncertainty and Diversification. Univ. Press Plc, Ibadan. ISBN 978-030-960-8. Website: www.universitypressplc.com (7) Isinika, A.C., G.M. Mibavu, and J.J. VanSickle (2016). Agricultural Policy Analysis Studies in Tanzania: A Historical and Thematic Perspective with Implications on Future Policy Research for Crop Production and Marketing. <i>Tanzania Journal of Agricultural Sciences</i> 15 (1): 51-68 (8) Jhingan, M.L. (2011): The Economics of Development and Planning. VRINDA publications (P) Ltd, Delhi, India. ISBN 978-81-8281-385-4 (9) Monke, E.A. and Pearson, S.R (1989). THE POLICY ANALYSIS MATRIX FOR AGRICULTURAL DEVELOPMENT. Outreach Program Publisher.201p (10) Norton, R.D. (2004). Agricultural Development Policy Concept and Experience. John willey press. (11) Schertz, L.P. (1996). Agricultural Policy Analysis: Discussion. <i>Journal of Agricultural and Applied Economics</i>, 28,1 (July 1996):52-56 <p>Important Note: This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote about 180 hours to learning of the course content, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using econometric software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent.</p>

AGRICULTURAL PRODUCTION ECONOMICS

Module code AES 807	Student workload 120 hours	Credits (according to ECTS) 4.0 ECTS	Semester 1 st . Sem.	Frequency One time in each semester and per session	Duration 15 Weeks
1	Types of courses a) Class Work b) Seminars c) Students' Presentation	Contact hours 30 hours	Independent study 90 hours	Class size Avg of 20 (Max 40)	
2	Prerequisites for participation Participation is subject to confirmation of student registration for the course Basic knowledge of Agricultural Production Economics at the first degree				
3	Learning outcomes After the completion of this course, the Students will: a) Be able to understand the theory of production and its application in agricultural industry b) estimate production and cost c) be able to measure productivity, efficiency, productivity growth and make farm planning under uncertainty on their own e) estimate dynamics and technology change f) understand optimization of production and farm planning under uncertainty				
4	Subject aims The aim of the module is to 1. Equip students with necessary skills to be able to determine production efficiency, productivity, profitability of farm enterprises 2. Plan for production under certainty and uncertainty 3. Develop students' problem-solving skills to propose appropriate response strategies to climate change and variability affecting agricultural production Course Contents Theories of production; agricultural production functions; resources returns in agriculture; agricultural cost and supply function; Optimization of production and farm planning under uncertainty; efficiency and innovation in agriculture. Fixed asset theory, dynamics and technology change.				
5	Teaching methods Lectures, sharing of materials via learning tools, global scenarios on agricultural topics, case studies, group work, individual presentations, and discussions				
6	Assessment methods Individual Presentations, Group Assignments, Continuous Assessment, Summative Assessment, Written end-of-the-semester examination Continuous Assessment Tests (20%), Assignment (10%) and Examination (70%)				

7	<p>This module is used in the following degree programmes as well</p> <p>Master in Agricultural Economics and Farm Management (M. Agric) FUNAAB</p>
8	<p>Responsibility for module</p> <p>Dr. Dare Akerele</p>
9	<p>Other information</p> <p>a) References</p> <ol style="list-style-type: none"> 1. David L. Debertin. Agricultural Production Economics (Second. Edition, Amazon Createspace 2012), published by Macmillan. (First Edition, Macmillan, 1986) 2. Bruce R. Beattie, Charles Robert Taylor, Myles J. Watts (2009). The Economics of Production, Second Edition. Krieger Publishers, 2009 3. John P. Doll, Frank Orazem (1978). Production Economics: Theory with Applications. Wiley, 1978 4. Chauncey T. K. Ching, John Fumio Yanagida (1985) Production Economics: Mathematical Development and Applications. Transaction Publishers, 1985 <p>b) This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 4.0 ECTS credit equivalent.</p>

RESOURCE AND ENVIRONMENTAL ECONOMICS						
Module Code	Student workload	Credits (according to ECTS)	Semester	Frequency	Duration	
AES 808	180 hours	6.0	Second Semester	Once every academic session by the Second Semester	15 Weeks	
1	Types of courses Theory with Field Practical and Class Presentations	Contact hours 45 hours	Independent study 135 hours	Class size Avg of 20 (Max 40)		
2	<p>Prerequisites for participation</p> <p>Good knowledge of microeconomics, calculus, statistics and research methods evidenced by at least Grade C level passes of these or related courses at undergraduate levels. Ability to read, speak and write in English Language evidenced by at least O level Credit Pass in English Language.</p>					

3	<p>Learning outcomes</p> <p>Upon a successful completion of this course, students should be able to:</p> <ol style="list-style-type: none"> Understand causes of market failure, and the link to environmental degradation and/or unsustainable use of ecosystems and natural resources; Be familiar with the main types of policy tools that governments can use to correct “market failures” related to the environment and natural resources; Apply non-market valuation techniques, including hedonic pricing, contingent valuation and choice experiments, among others, in support of Social Benefit-Cost Analysis in respect of ecosystems and natural resource uses problems; and Use economic modelling to evaluate various approaches to the design of efficient environmental policies and of rules for the optimal management of natural resources.
4	<p>Subject aims/Content</p> <p>This course exposes students to the economic principles underlying the design of efficient environmental policies and the optimal management of natural resources. It identifies conditions under which market failures lead to unsustainable use of ecosystems and natural resources, and discusses economic policies that can counteract such market failures. It exposes students to non-market valuation techniques including hedonic pricing, contingent valuation and choice experiments as tools of economic valuation in support of Social Benefit-Cost Analysis. Students are required to apply these tools in a practical analysis of a resource or environmental policy issue of relevance to themselves or country of origin.</p>
5	<p>Teaching methods</p> <p>Class lectures, case studies, field practical/group work, assigned readings and discussions.</p>
6	<p>Assessment methods</p> <p>Graded assignments (5-10marks), mid-semester test (15 - 20 marks), course project report and presentations based on field practical/group work (20 - 30marks) and final examination (50 marks)</p>
7	<p>This module is used in the following degree programmes as well</p> <p>M. Agric. Agricultural Economics (Environmental and Resource Economics Option)</p>
8	<p>Responsibility for module</p> <p>Prof. Adebayo M. Shittu</p>
9	<p>Other information</p> <p>1. References</p> <ul style="list-style-type: none"> Baker, R. and Ruting, B. (2014). <i>Environmental Policy Analysis: A Guide to Non-Market Valuation</i>, Productivity Commission Staff Working Paper, Canberra Dasgupta, P. (2010). The Place of Nature in Economic Development, Chapter 74 in Rodrik D and Rosenzweig, M. (Eds), <i>Handbook of Development Economics</i>, 5: 4977-5046. Kahn, J.R. (2005). <i>The Economic Approach to Environmental and Natural Resources</i>. Third Edition, Thomson South-Western Perman R., Ma, Y., Common, M., Maddison, D., and McGilvray, J. (2011). <i>Natural Resource and Environmental Economics</i>. Fourth Edition, Pearson-Addison Wesley <p>2. Important Note</p>

<p>This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent.</p>
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MATHEMATICS FOR ECONOMISTS					
Module code	Student workload	Credits	Semester	Frequency	Duration
AES 809	120 hours	4.0 ECTS	1 st . Sem.	Each First Semester	15 Weeks
1	Types of courses Class Work	Contact hours 30 hours	Independent study 90 hours	Class size (Potential) Avg of 20 (Max 40)	
2	<p>Prerequisites for participation</p> <p>a) Participation in the course is required for all students admitted for M.AgSE</p> <p>b) Student's participation is subject to confirmation of registration for the course</p> <p>c) Students are expected to have basic knowledge of mathematical principles</p>				
3	<p>Learning outcomes</p> <hr/> <p>Knowledge outcomes</p> <p>Consequent on following this course using various materials and resources, the students will be able to learn the fundamentals of further mathematical methods and theories. This will equip them with the basic tools and concepts needed for understanding agricultural economic (microeconomics and macroeconomics) theory required for scholarly, scientific research and reports.</p> <p>Specifically, students will be able to:</p> <p>a) have an understanding the presentation of economic concepts and theories with mathematical expressions analytical tools their applications in agriculture;</p> <p>b) have a thorough understanding of utilising underlying economic theories, concepts and principles in analysing the problems inherent in the relationships between individual agents (consumers, business firms and investors) as well as their interaction through markets and other social institutions;</p> <p>c) appreciate and comprehend economic theory with the use of empirical procedures and techniques;</p> <p>d) empirically comprehend the analytical techniques of basic economic theories, concepts and principles such as utility maximization, profit maximization, market equilibrium, inequality, price discrimination, partial and general equilibrium;</p> <p>e) <i>emphasis will be placed on the applications of theories, concepts and principles learnt in agriculture.</i></p>				

	<p>Skills Outcomes</p> <p>The students will be able to:</p> <p>a) to read scientific articles in the fields of economics, finance and management science while understanding the role of invoked microeconomic assumptions and the references to standard microeconomic results;</p> <p>b) use mathematical tools and a sound economic intuition in formulating expressions for (agricultural) economics research question as a formal model;</p> <p>c) itemize key measurable parameters germane for operationalizing economic models;</p> <p>d) obtain useful economic predictions from the analysis obtained from formal (mathematical) models.</p>
4	<p>Subject aims</p> <p>The module is designed to be an upper-level in mathematics for economists to sharpen students' analytical skills in addressing microeconomics and macroeconomic issues such as consumer and producer theory, demand and supply theory, theory of the firm, labor and capital markets, externalities, and public goods.</p> <p>Course Contents</p> <p>Students will learn the following:</p> <p>a. Functions and equations (exponents, polynomials; geometric interpretation – graphs, slopes, intercepts; linear, quadratic and simultaneous equations will be reviewed);</p> <p>b. Derivatives and rules of differentiation;</p> <p>c. Calculus of multivariable (implicit functions, partial and total differentiation, optimization of multivariable functions, optimal growth models);</p> <p>d. Exponential and logarithmic functions (interest compounding and discounting);</p> <p>e. Matrix algebra (definition of terms and matrix operation - multiplication, addition and determinants - solving Simultaneous Linear Equations, input-output analysis);</p> <p>f. Linear programming (definitions and terms, graphic solution and the simplex algorithm approaches);</p> <p>g. Integration (definite and indefinite integrals), Taylor's theorem;</p> <p>h. Differential and Difference equations;</p> <p>i. Sequences and series;</p> <p>j. Set theory and basic logic;</p> <p>k. Basic games theory.</p>
5	<p>Teaching methods</p> <p>Lectures, sharing of materials via learning tools, case studies and discussions.</p>
6	<p>Assessment methods</p> <p><i>Components:-</i> Group Assignments, Continuous Assessment Test(s) and Written end-of-the-semester examination</p> <p><i>Grading scale:-</i></p> <p>a. Group Assignments - 10%;</p> <p>b. Test(s) - 30%</p>

	c. Final Examination - 60%
7	This module is used in the following degree programmes as well N/A
8.	Responsibility for module Dr. SANUSI Rahman Akintayo
9	<p>Other information</p> <p>1. Suggested Further Readings</p> <p>(a) Carl, C. P. and Blume, L. (1994). Mathematics for Economists. Published by W. W. Norton and Company, New York, USA. 899pp.</p> <p>(b) Dowling, E. T. (1992). Introduction to Mathematical Economics. Schaum's Outline Series of Theory and Problems. Second edition. Published by McGraw-Hill Inc, New York, USA. 485pp.</p> <p>(c) Gulati, B. R. (1978). College Mathematics with Applications to the Business and Social Sciences. Published by Harper & Row, Pennsylvania, USA. 334pp</p> <p>(d) Jacques, I. (2006). Mathematics for Economics and Business. Fifth edition. Published by Pearson Education Limited, Edinburgh, England, UK. 694pp.</p> <p>(e) Kwak, N. K. (1973). Mathemathecal Programming with Business Application. Published by McGraw-Hill Inc, New York, USA.</p> <p>(f) Rosser, M. (2003). Basic Mathematics for Economists Second Edition. Routledge, New York, USA. 535pp.</p> <p>(g) Wheeler, R. E. and Peebles, W. D. (1975). Modern Mathematics with Applications to Business and the Social Sciences. 2nd edition. Published by Brooks/Cole Publishing Company, Pennsylvania, USA. 607pp.</p> <p>(h) Werner, F. and Sotskov, Y. N. (2006). Mathematics of Economics and Business. First edition. Routledge, New York, USA. 537pp.</p> <p>2.0 Important Note:</p> <p>This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 4.0 ECTS credit equivalent.</p>

RESEARCH METHODOLOGY AND EXPERIMENTAL DESIGN						
Module code	Student workload	Credits	Semester	Frequency	Duration	
AES 810	180 hours	6.0 ECTS credits	2 nd . Sem.	One time in each Second Semester	15 Weeks	
1	Types of courses	Contact hours	Independent study	Class size		
	a) Class Work b) Seminars c) Students' Presentation	45 hours	135 hours	Avg of 20 (Max 40)		
2	Prerequisites for participation					
	a) Participation in the course is compulsory for all students admitted for M.AgSE					

	<p>b) Participation is subject to confirmation of student registration for the course</p> <p>c) Basic knowledge of statistics and Research methods at the first degree</p>
3	<p>Learning outcomes</p> <p>After the completion of this course, the Students will:</p> <ol style="list-style-type: none"> 1) Be able to understand research process and scientific methods as applied in agricultural economics. 2) Understand sample designs and be able to apply the appropriate design and in agricultural researches 3) Understand methods of collecting data, questionnaire design and testing, field organization, and analysis of data
4	<p>Subject aims</p> <p>The aim of the module is to</p> <ol style="list-style-type: none"> 1) Expose students to field organization, and analysis of data 2) Equip students with the skills of sampling and experimental designs, methods of collecting data, questionnaire design and testing 3) Make students to be able to develop a research proposal that may be associated with his or her thesis <p>Course Contents</p> <p>Discusses the research process and scientific method as applied in agricultural economics. Topics include problem identification, stating hypotheses, sources of data, sampling concepts and designs, methods of collecting data, questionnaire design and testing, field organization, and analysis of data. During the semester, each student develops a research proposal that may be associated with his or her thesis. Completely randomized designs randomized complete block design, lattice squares, factorial experiments, confounding variables. Analysis of data from animal production based research using statistical packages.</p>
5	<p>Teaching methods</p> <p>Class lectures, case studies, field practical/group work, assigned readings and discussions.</p>
6	<p>Assessment methods</p> <p>Continuous Assessment Tests (20%), Assignment (10%) and Examination (70%)</p>
7	<p>This module is used in the following degree programmes as well</p> <p>N/A</p>
8.	<p>Responsibility for module</p> <p>Prof. Carolyn A. Afolami</p>
9	<p>Other information</p> <p>1. Recommended Text</p> <ol style="list-style-type: none"> a) Fundamentals of Research Methods: Economic, Environmental and Social Issues. Edited by Okuneye Peter Adebola. Published by Livelihoods Support and Development Centre (SLIDEN Africa), Nigeria 2016 b) Philip CashTino Stanković Mario łorga (2016): Experimental Design Research: Approaches, Perspectives, Applications. Switzerland : Springer, c) John W. Creswell (2002). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Published July 23rd 2002 by SAGE Publications, Inc d) Nicholas Walliman (2010) . Research Methods: The Basics

e) Dooley, David. 2001. Social research methods. 4th ed. Upper Saddle River, NJ: Prentice Hall. 385p.
<p>2. Important Note</p> <p>This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote about 180 hours to learning of the course content, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using econometric software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent.</p>

FINANCIAL MANAGEMENT AND ACCOUNTING					
Module code	Student workload	Credits	Semester	Frequency	Duration
AES 811	120 hours	4.0 ECTs	1 st . Sem.	One time in each First Semester	15 weeks
1	Types of courses a) Class Work b) Seminars c) Students' Presentation	Contact hours 30 hours	Independent study 90 hours	Class size Avg of 20 (Max 40)	
2	<p>Prerequisites for participation</p> <p>Participation in the course is optional for student admitted for M. AgSE</p> <p>Participation is also always subject to confirmation of student registration for the course.</p>				
3	<p>Learning outcomes</p> <p>On successful completion of this course students will be able to understand:</p> <p>a) Be able to prepare and interpret figures from various financial statements/reports</p> <p>b) Reconcile financial records and accounts</p>				
4	<p>Subject aims</p> <p>The aim of the module is to</p> <ol style="list-style-type: none"> 1. Equip students with basic knowledge of the principles and concepts of financial management of farms and agribusiness firms 2. Equip students with the basic skills of business records book keeping and accountings 3. Develop students' to be able to enter data for ledger, and sub-ledger compliance in order to meet auditing requirements 4. Prepare students to be able to prepare and interpret financial reports including budget, cash flow statement, trial balance, Profit and Loss Account and Balance Sheet <p>Course Contents</p> <p>Principles and concepts of Financial Management of Farms and Agri-business firms. Strategies for acquiring and using capital resources. Business Records and Accounts. Book Keeping, Petty cash administrative. Reconciling financial records and Accounts. Creditor and Debtor Invoicing. Preparing and Processing Banking documents. Data entry for ledger, and sub-ledger compliance. Meeting an Auditing requirement. Preparing and</p>				

	Interpreting Financial reports including Budget, cash flow statement, trial balance, Profit and Loss Account and Balance Sheet. Finance and Insurance Institution
5	Teaching methods Lectures, sharing of materials via learning tools, case studies, group work, individual presentations, and discussions
6	Assessment methods Individual Presentations, Group Assignments, Continuous Assessment, Summative Assessment, Written end-of-the-semester examination Continuous Assessment Tests (20%), Assignment (10%) and Examination (70%)
7	This module is used in the following degree programmes as well N/A
8	Responsibility for module Mr. Benjamin Atilade Bolarinwa
9	Other information 1) References (a) Anao A. R. (1996). An Introduction to Financial Accounting (Second Edition). Longman, Nigeria. (b) Business Accounting 1 (12 th Edition): Frank Wood and Alan Sangster (c) Robert O. Igben (2004). Financial Accounting Made Simple (FAMS) ROI Publisher, Nigeria (d) Accounting; An Introduction: Eddie Mclaney and Peter Atrill (f) Financial Accounting, An Introduction: Weetman P (g) Corporate Finance Simplified Manual: A Afolabi
	2.0 Important Note: This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 4.0 ECTS credit equivalent.

FARM PLANNING, MONITORING AND EVALUATION						
Module code	Student workload	Credits	Semester	Frequency	Duration	
AES 812	120 hours	4.0 ECTS	2 nd . Sem.	One time in each Second Semester	15 Weeks	
1	Types of courses	Contact hours	Independent study	Class size		
	a) Class Work	30 hours	90 hours			

	b) Seminars c) Students' Presentation d) Field trip and case studies			Avg of 20 (Max 40)
2	Prerequisites for participation a) Participation in the course is compulsory for all students admitted for M.AgSE b) Participation is subject to confirmation of student registration for the course			
3	Learning outcomes After the completion of this course, the Students will: a) be able apply various tools in farm planning and management b) be able to conduct and prepare feasibility study and report writing c) be able to prepare a bankable business plan d) be able to plan under risk and uncertainties e. do environmental impact assessment			
4	Subject aims The aim of the module is to 1) be able to understand farm planning, monitoring and evaluation in Farm Business Management. 2) able to plan for Environmental Impact Assessment (EIA) Course Contents Application of concepts and tools of Farm Business Management in Farm Planning and firm management. Feasibility Studies and Business Plan. Business Analysis and Planning. Interpretation and use of information for decision making in organizing and operating farm business to achieve goals. Methods of Farm Planning. Planning under risk and uncertainties. Farm Finance and Appraisal. Capital requirement in Agriculture. Monitoring and Evaluation. Cost Benefit Analysis. Time value of money. Planning Environmental Impact Assessment, Impact mitigation and compensation			
5	Teaching methods Class lectures, case studies, field practical/group work, assigned readings and discussions.			
6	Assessment methods The course is evaluated through various combinations of methods : final examinations, term papers, and oral presentations, individual study and group work This course will be graded as follows: Assignments 10%, Test(s) 20% Final Examination 70%			
7	This module is used in the following degree programmes as well N/A			
8.	Responsibility for module Prof. Peter Adebola Okuneye			
9	Other information 1. Recommended materials			

	<p>a) Planning, Monitoring, and Evaluation: Methods and Tools for Poverty and Inequality Reduction Programs. World Bank, Washington D. C,</p> <p>b) James Price Gittinger (1982). Economic analysis of agricultural projects. Economic Development Institute of the World Bank</p>
	<p>2.0 Important Note</p> <p>This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote about 120 hours to learning of the course content, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using econometric software to analyse data). Hence, the course is of 4.0 ECTS credit equivalent.</p>

POLICY IN ENVIRONMENTAL DECISION MAKING AND AGRICULTURE						
Module code	Student workload	Credits (according to ECTS)	Semester	Frequency	Duration	
AES 813	180 hours	4.0 ECTS	1 st . Sem.	Once in each First Semester per session	15 Weeks	
1	Types of courses a) Class Work b) Seminars c) Students' Presentation	Contact hours 45 hours		Independent study 135 hours	Class size Avg of 20 (Max 40)	
2	Prerequisites for participation Participation is subject to confirmation of student registration for the course					
3	Learning outcomes After the completion of this course, the Students will be able to: a) understand the economics of policy making in environmental decision making and the integration of such concerns into agriculture. b) understand the formulation of policy through understanding the linkages existing between economic activities in agriculture, human welfare and the environment. c) assess critically the existing environmental policies and determine the need to undertake policy reforms. d) understand the trade-offs between "economic goods" and environmental quality to sensitize mitigation through policy formulation. e) know the general pervading environmental issues – local and international to be mitigated through relevant cost-effective policies, international agreements and treaties.. f) understand the different instruments of policy that can be applied in decision making in environment and agriculture. g) understand the criteria for choosing among types of policies for decision making in environment and agriculture.					

	<p>h) understand the quantitative skills of project appraisal and valuation to incorporate in policy decision making in environment and agriculture.</p> <p>(i) identify negative agri-environmental indicators in agricultural performance and respond with relevant mitigation policies.</p>
4	<p>Subject aims</p> <p>The aim of the module is to</p> <ol style="list-style-type: none"> 1. create the awareness in the students that sustainability engendered by the interaction of economic development and the environment is the basis of life existence on earth and that environmentally-friendly agricultural practices guarantee food security. 2. establish that policies in environmental decisions making need to be incorporated into rural development project plans especially those that need capital/aid assistance form public, private or non-governmental organizations. 3. motivate the students to “telescope” and learn from environmental policies and regulations performing well in developed countries to adapt them for adoption especially in the rural development sector where agricultural production is functional. 4. Sharpen the knowledge and skills of students in environmental project appraisal and valuation and sensitize them on how policies emanate from the outcomes. <p>Course Contents</p> <p>The origin of the sustainability problems; Concepts of sustainability; Ethics, economics and the environment; Demand-Supply analysis of environmental problems; Linkages between Rural Economic Activities, Human welfare and the environment; Pollution control: targets; Pollution control Instruments: Voluntary programs, Direct controls, taxes on emissions; Other Financial Devices to Protect the Environment: Subsidies and Emission permits (Emission offset programme; Bubble Concept Programme); Emission taxes versus Direct Controls; Criteria for choosing among types of policies for environmental decision making and agriculture; Integrating environmental concerns into agricultural policies; International environmental problems; European Union Regulations with increased influence on farming activities; Project Appraisal: Cost-Benefit Analysis, Valuing the environment; Irreversibility, risk and uncertainty.</p>
5	<p>Teaching methods</p> <p>Lectures, sharing of materials via learning tools, global scenarios on agricultural topics, case studies, group work, individual presentations, and discussions</p>
6	<p>Assessment methods</p> <p>Individual Presentations, Group Assignments, Continuous Assessment, Summative Assessment, Written end-of-the-semester examination</p> <p>Individual Assignments 10%, Test(s) 10%, Policy paper presentation (10%), Final Examination 70%</p>
8	<p>Responsibility for module</p> <p>Prof. Luke O. Okojie</p>
9	<p>Other information</p> <p>a) References</p>

- (1) Baumol, W. J. and Blinder, A. S. (1982). ***Economics: Principles and Policy***, 2nd Edition, Harcourt Brace Jovanovich, Inc.
- (2) Eccleston, Charles H. (2010). *Global Environmental Policy: Concepts, Principles, and Practice*. ISBN 978-1439847664.
- (3) "Environmental Policies and Instruments" <http://www.oecd.org/department/03355en2649342811111100.html>
- (4) Fernando and P. Carvalho (2006). Agriculture, pesticides, food security and food safety, ***Environmental Science and Policy***, Vol 9(7-8): 685-692.
- (5) "Instrument Mixes for Environmental Policy" (Paris: OECD Publications, 2007) 15–16.
- (6) Marcia S. DeLonge, Albie Miles, and Liz Carlisle (2016). Investing in the transition to sustainable agriculture, *Environmental Science and Policy*, Vol.55(1): 266-273.
- (7) OECD (1998). ***Agriculture and the environment : issues and policies***, Paris, OECD (OPUB OECD FOOD 1C:8)
- (8) Potter, C. (2002). Agri-environmental policy development in the European Union in, Brouwer, F. and Van der Straaten, J. eds, ***Nature and Agriculture in the European Union***, Cheltenham, Edward Elgar. ARTS 338.1094 P2.
- (9) Roger Perman, Yua Ma, Jamees McGilvaray and Michael Common (1996). ***Natural Resource and Environmental Economics***, 3rd Edition, Pearson Addison Wesley.
- (10) Scott, S. (1997). 'Agriculture and forestry', Chapter 4 in Barrett, A., Lawlor, J. and Scott, S. ***The Fiscal System and the Polluter Pays Principle***, Aldershot, Ashgate. ARTS 363.73 N73.

	<p>(11) ,ReinoutHeijungs,BenjaminSprecher, ArnoldTukker, LauraScherer^aPaulBehrens (2018). Trade-offs between social and environmental Sustainable Development Goals, <i>Environmental Science and Policy</i>, Vol. 90: 65-72.</p> <p>(12) Tara Garnett (2009). Livestock-related greenhouse gas emissions: impacts and options for policy makers, <i>Environmental Science and Policy</i>, Vol. 12 (4), pp491-503. https://doi.org/10.1016/j.envsci.2009.01.006</p> <p>(13) Uwe Latacz-Lohmann and Ian Hodge (2003). <u>European agri-environmental policy for the 21st century</u>, The Australian Journal of Agricultural and Resource Economics, 47(1): 123–139.</p>
	<p>b. Important Note</p> <p>This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent.</p>

MARKETING & AGRO-INDUSTRIAL SUPPLY CHAIN MANAGEMENT					
Module code AES 814	Student workload 120 hours	Credits 4.0 ECTs	Semester 2 nd . Sem.	Frequency One time in each Second Semester	Duration 15 Weeks
1	Types of courses a) Class Work b) Seminars c) Students' Presentation	Contact hours 30 hours	Independent study 90 hours	Class size Avg of 20 (Max 40)	
2	Prerequisites for participation a) Participation in the course is compulsory for all students admitted for M.AgSE b) Participation is subject to confirmation of student registration for the course				
3	Learning outcomes The aim of the module is to a) prepare student to be able to apply the appropriate design and manage agricultural marketing channel for any agro-allied products b) understand competitions existing between Agricultural Products in Domestic and Foreign Trade c) understand the global Agrifood system through case studies				

4	<p>Subject aims</p> <p>The general objective is to understand basic marketing concepts and elements.</p> <p>The specific course contents are:</p> <p>Marketing Concepts. Marketing Mix. Industrial Organization. Competition for Agricultural Products in Domestic and Foreign Trade. Current development affecting market structure including effect of contractual agreement. Vertical Integration. Government Policy and Regulation. Traditional Livestock Supply Chain.</p> <p>The global Agrifood system; The traditional supply chains & its “bullwhip” effect; Food supply chain networks; Supply Chain Management and Logistics; Supply chain redesign; Case Studies of Supply Chain Management in the Agrifood Sector; Critical Success Factors in Supply Chain Management.</p>
5	<p>Teaching methods</p> <p>Class lectures, case studies, field trip, assigned readings and discussions.</p>
6	<p>Assessment methods</p> <p>The course is evaluated through various combinations of methods : final examinations, term papers, and oral presentations, individual study and group work</p> <p>This course will be graded as follows: Assignments 10%, Test(s) 20% Final Examination 70%</p>
7	<p>This module is used in the following degree programmes as well</p> <p>N/A</p>
8.	<p>Responsibility for module</p> <p>Dr. Adeyemo Ganiyu Adeyemo</p>
9	<p>Other information</p> <p>1. Recommended materials</p> <p>a) Chandrasekaran, N. and G. Raghuram (2004). Agribusiness Supply Chain Management. CRC Press Book</p> <p>b) Samir Dani (2015). Food Supply Chain Management and Logistics: From Farm to Fork. Kogan Page, London. ISBN 9780749473648</p> <p>c) Jack G.A.J. van der Vorst, Carlos A. da Silva and Jacques H. Trienekens (2007). Agro-industrial supply chain management: concepts and applications. Agricultural Management, Marketing and Finance Occasional Paper. Food And Agriculture Organization of the United Nations, Rome, 2007</p> <p>e) Agro-industries for Development. Edited by C da Silva, FAO, Italy, D Baker, FAO, Italy, A Shepherd, FAO, Italy, C Jenane, UNIDO, Austria, S Miranda-da-Cruz, UNIDO, Austria in 2009. CABI Publication</p>
	<p>2. Important Note</p> <p>This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote about 120 hours to learning of the course content, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using econometric software to analyse data). Hence, the course is of 4.0 ECTS credit equivalent.</p>

INTEGRATED ECONOMIC MODELING AND SUSTAINABLE DEVELOPMENT					
Module code AES 815	Student workload 120 hours	Credits (according to ECTS) 4.0 ECTS	Semester 1 st Sem.	Frequency One time in each First Semester	Duration 15 Weeks
1	Types of courses a) Class Work b) Seminars c) Students' Presentation	Contact hours 30 hours	Independent study 90 hours	Class size Avg of 20 (Max 40)	
2	Prerequisites for participation It is an elective course. Student can only participate if registered for the course.				
3	Learning outcomes After the completion of this course, the Students will: Be able to apply modelling approaches to real-world interdisciplinary economic problems				
4	Subject aims a) To develop an understanding of the emerging concept of sustainable development; b) To analyse the value base behind a range of different interpretations of sustainable development; C) To appreciate the differences of approach to sustainable development Course Contents Understand some of the complexities of interdisciplinary policy problems, particularly in the areas of sustainable development; Integrated modelling approaches to real-world interdisciplinary economic problems; description of Microsoft Windows environment and an application of MS Office such as Word, Excel and PowerPoint; multivariate forecasting models; computer analysis of linearized and nonlinear models using Excel and General Algebraic Modelling System (GAMS); use of Agent-Based Modelling (ABM)				
5	Teaching methods Lectures, sharing of materials via learning tools, case studies, group work, individual presentations, and discussions				
6	Assessment methods Individual Presentations, Group Assignments, Continuous Assessment, Summative Assessment, Written end-of-the-semester examination Continuous Assessment Tests (20%), Assignments (10%) and Examination (70%)				
7	This module is used in the following degree programmes as well N/A				
8	Responsibility for module Course coordinator is responsible for teaching in class and grading of students efforts				
9	Other information				

	<p>1) References</p> <p>a) Robert H. W. Boyer , Nicole D. Peterson , Poonam Arora and Kevin Caldwell (2016). Five Approaches to Sustainability and an Integrated Way Forward. Sustainability 2016, 8, 878; doi:10.3390/su8090878</p> <p>b) Farhad Noorbakhsh & Sanjeev Ranjan (1999) A model for sustainable development: integrating environmental assessment and project planning, Impact Assessment and Project Appraisal, 17:4, 283-293 10.3152/147154699781767684</p> <p>C) Dresner, S. (2002) The Principles of Sustainability, Earthscan, London.</p> <p>d) Wackernagel, M. and Rees, W. (1996) Our Ecological Footprint: Reducing Human Impact on the Earth, New Publishers, Gabriola Island BC, Canada.</p> <p>e) Diana BAGDONIENĖ, Asta DAUNORIENĖ, Aušra SIMANAVIČIENĖ (2011). Integration of Sustainable Development Principles into The Balanced Scorecard. Intellectual Economics , 5(3):460–476Note:</p>
	<p>2.0 Important Note:</p> <p>This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 4.0 ECTS credit equivalent.</p>

APPLIED WELFARE ECONOMICS					
Module code	Student workload	Credits	Semester	Frequency	Duration
AES 816	120 hours	4.0 ECTS	2 nd . Sem.	One time in each Second Semester	15 Weeks
1	<p>Types of courses</p> <p>a) Class Work</p> <p>b) Seminars</p> <p>c) Students' Presentation</p>	Contact hours	Independent study	Class size	
		30 hours	90 hours	Avg of 20 (Max 40)	
2	<p>Prerequisites for participation</p> <p>a) This is an elective course and is optional for students admitted for M. AgSE</p> <p>b) Participation is subject to confirmation of student's registration for the course</p>				
3	<p>Learning outcomes</p> <p>On successful completion of this course students will be able to understand:</p> <p>a) fundamentals of welfare economics. Poverty, income inequality</p> <p>b) choice and rationality</p> <p>c) expected utility and choice under uncertainty</p> <p>d) the effect of public policies on consumer and firm behaviour</p> <p>e) monopoly, oligopoly and monopsony markets</p>				

	<p>f) game theory</p> <p>g) general equilibrium</p> <p>f) measure household and social welfare</p> <p>h) Key concepts and issues: 1) Market failure: externalities, asymmetric information, public goods and common pool resources. 2) Policy instruments and its applications 3) Environmental policy, management of natural resources, public goods and common pool resources. 4) Human health and nutrition policies and why do we care. 5) Local food issues and consumers behaviour</p>
4	<p>Subject aims</p> <p>The aim of the module is to</p> <p>a) Make students appreciate the how to measure welfare change as a results of policy changes</p> <p>b) Equip students with necessary skills to be able to determine valuation of market and non-market goods</p> <p>c) equip students with knowledge of evaluating policies as taxes, price supports, quotas, pollution controls, environmental damage liability, and intellectual property rights and externality on welfare</p> <p>d. Bring students up-to-date with practical methods of comparative static analysis of the effect of public policies on consumer and firm behaviour, and on market equilibrium</p> <p>f) make students to understand causes and effects of market failures</p> <p>course contents:</p> <p>Review of measures of household welfare, willingness to pay, and notions of Pareto optimality, aggregate welfare and market failure. Practical methods of comparative static analysis of the effect of public policies on consumer and firm behaviour, and on market equilibrium. Theory of externalities and welfare implications of market versus non-market allocation of public goods. Applications include evaluation of such policies as taxes, price supports, quotas, pollution controls, environmental damage liability, and intellectual property rights.</p>
5	<p>Teaching methods</p> <p>Lectures, sharing of materials via learning tools, <i>case studies, group work, individual presentations, and discussions</i></p>
6	<p>Assessment methods</p> <p>Individual Presentations, Group Assignments, Continuous Assessment, Summative Assessment, Written end-of-the-semester examination</p> <p>This course will be graded as follows: Assignments 10%, Test(s) 20% Final Examination 70%</p>
7	<p>This module is used in the following degree programmes as well</p> <p>Master in Agricultural Economics and Farm Management (M. Agric) in Department of Agricultural Economics and Farm Management, FUNAAB</p>
8.	<p>Responsibility for module</p> <p>Dr. Abiodun Elijah Obayelu</p>
9	<p>Other information</p> <p>1. Recommended materials</p> <ul style="list-style-type: none"> David A. Besanko, Ronald R. Braeutigam (2010). Microeconomics. 4th Edition. Publisher: John Wiley & Sons;

	<ul style="list-style-type: none"> • Richard E. Just, Darrell L. Hueth, Andrew Schmitz (2004): The Welfare Economics of Public Policy: A Practical Approach to Project and Policy Evaluation. Published by Edward Elgar Publishing Limited, UK. • Varian, Hal R. (1992). Microeconomic analysis.3rd Edition, Library of Congress Cataloging-in-Publication, USA • Yew-Kwang Ng (2004). Welfare Economics: Towards a More Complete Analysis Palgrave Macmillan
	<p>2. Important Note</p> <p>This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30hours of class lectures and demonstrations. Students are however, expected to devote about 120 hours to learning of the course content, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using econometric software to analyse data). Hence, the course is of 4.0 ECTS credit equivalent.</p>

FOOD, HEALTH AND NUTRITION ECONOMICS					
Module code	Student workload	Credits (according to ECTS)	Semester	Frequency	Duration
AES 817	120 weeks	4.0 ECTS	1 st . Sem.	One time in each First Semester	15 Weeks
1	Types of courses a) Class Work b) Seminars c) Students' Presentation	Contact hours 30 hours	Independent study 90 hours	Class size Avg of 20 (Max 40)	
2	Prerequisites for participation It is an elective course .Student can only participate if registered for the course				
3	<p>Learning outcomes</p> <p>Knowledge outcomes</p> <p>At the end of this course, the students will be able to learn the fundamental economics methods and theories applicable to food, livestock and health. Specifically, they will be able to have an understanding of the concept of:</p> <p>a) food economics; b) livestock economics; c) health economics.</p> <p>Skills Outcomes</p> <p>Students will be able to demonstrably apply micro-economic theories and principles to the analysis of food, livestock and health issues. Students will be able to:-</p>				

	<p>1) describe livestock economics and explain the role and importance of food in an economy using the assumptions and principles of economic concepts such as Demand and Supply, Price Theory, Consumer Behaviour Theory, Theory of the Firm i.e. Theory of Production and Costs;</p> <p>2) analyze health issues using microeconomic concepts such as Demand and Supply, Price Theory, Consumer Behaviour Theory, Theory of the Firm i.e. Theory of Production and Costs, Market Systems and Market Structure;</p> <p>3) analyze food, livestock and health issues with the use assumptions and principles of macroeconomic concepts such as investment, interest rate, savings income distribution, and the labour market.</p> <p>4) identify germane measurable parameters, necessary for operationalizing (micro- and macro-) economic models in the analysis of food, livestock and health sub-sectors of the economy;</p> <p>5) obtain and manage useful economic predictions through the use of mathematical tools and a sound economic intuition.</p>
4	<p>Subject aims</p> <p>This course explores economic aspects of food safety, quality and nutrition and the ways in which economics can aid understanding of food safety, quality and nutritional issues. Food and Nutrition Security: Concepts, Measurements and Health Links; Environmental and Public Health Implications of Industrial Food Production; Social, Economic & Policy Consideration in Food Production; Cultural & Political Considerations in Food Consumption; Sustainable Food Production System; Public Health Management. It aims at explaining the structure and processes in the food, livestock and health sub-sector of the economy using micro and macroeconomics assumptions, principles and theories.</p> <p>Course Contents</p> <ul style="list-style-type: none"> i. Food Economics - <ul style="list-style-type: none"> a. The Concept of Food and Feed b. The Concept of Food Hub c. The Concept of Food Security d. Localization and Globalization of Agriculture e. The Concept of Industrial Agriculture f. Economics of Food Waste and Loss ii. Livestock Economics - <ul style="list-style-type: none"> a. The Role of Livestock in an Economy b. Livestock Production and Marketing c. Demand for Livestock Products and By-products iii. Health Economics - <ul style="list-style-type: none"> a. The Concepts of Health and Healthcare Economics b. Features and Functions of Healthcare Systems c. Healthcare Production and Demand d. Healthcare Marketing
5	<p>Teaching methods</p> <p>Lectures, sharing of materials via learning tools, case studies, group work, individual presentations, and discussions</p>
6	<p>Assessment methods</p> <p>Individual Presentations, Group Assignments, Continuous Assessment, Summative Assessment, Written end-of-the-semester examination</p>

	This is evaluated as follows: Class Attendance 5%, Exercise 10% (Assignments 5% and Case study paper 5%), Test(s) 25% Final Examination 60%
7	This module is used in the following degree programmes as well N/A
8	Responsibility for module Dr. Rahman Akintayo Sanusi
9	Other information 1) References Mostly online materials will be sourced and used for this course. Albeit, standard economics texts are the basis of the economic theory and principles to be utilized for the course. These include: a. Blanchard, O. and Johnson, D. R. (2012). <i>Macroeconomics</i> . Pearson Education International, 6 th ed. b. Salvatore, D. (1983). <i>Schaum's outline of Theory and Problems of Microeconomic Theory</i> . 5 th ed. McGraw-Hill. c. Perloff, J. M. (2013). <i>Microeconomics</i> . 6 th ed. Pearson Education Ltd. d. Olayide, S.O. and Heady, E. O. (1982). <i>Introduction to Agricultural Production Economics</i> . University Press, Ibadan. e. Debertin, D. L. (2012). <i>Agricultural Production Economics</i> . 2 nd ed. Macmillan Publishers. f. Adegeye, A. J. and Dittoh, J. S. (2015). <i>Essentials of Agricultural Economics</i> . New Era Oluji Nig. Ltd. Rev. Ed. g. <i>Health Economics (4th Edition)</i> 4th Edition by Charles E. Phelps. Published by Prentice Hall; 4 editions (February 20, 2009) h. <i>Food and Nutrition Economics: Fundamentals for Health Sciences (Food and Public Health)</i> 1st Edition by George C. Davis. Oxford University Press; 1 edition (April 13, 2016) i. <i>Encyclopedia of Health Economics</i> 1st Edition by A J. Culyer .Published by Elsevier, 2014
	2.0 Important Note: This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using statistical software to analyse data). Hence, the course is of 4.0 ECTS credit equivalent.

ORGANIZATION AND MANAGEMENT OF COOPERATIVE

Module code AES 818	Student workload 120 hours	Credits 4.0 ECTS	Semester 2 nd . Sem.	Frequency One time in each Second Semester	Duration 15 Weeks
1	Types of courses a) Class Work b) Seminars c) Students' Presentation	Contact hours 30 hours	Independent study 90 hours	Class size Avg of 20 (Max 40)	
2	Prerequisites for participation a) This is an elective course and is optional for students admitted for M. AgSE b) Participation is subject to confirmation of student's registration for the course				
3	Learning outcomes On successful completion of this course students will be able to: a) have a practical understanding of the organization and management of cooperatives in Nigeria. b) understand the principles that guide the formation, organization, and activities of cooperative c) appreciate the Uniqueness of Co-operative as a business entity d) appreciate the Hierarchical Relationship of the Co-operative Management Organs, Responsibilities of each organ e) be able to explain common issues that cause conflicts in Cooperative Societies and understand the essential principles of Conflict resolution f) have a working knowledge of Performance Appraisal technique				
4	Subject aims The aim of the module is to enable students to be able to i. Explain the nature of cooperatives. ii. Trace the history of Cooperative Movement in Nigeria; identify the problems of Cooperatives iii. Explain the principles that guide the formation, organization, and activities of cooperatives. iv. Understand the laws which underlie the organisation and management of cooperatives v. Explain the unique nature of a Cooperative as a Business entity in terms of decision-making processes, management selection, structure and returns on equity. vi. Explain the Hierarchical Relationship of the Co-operative Management Organs and the Governance and Management Structure of a Co-operative Organization vii. Explain the Nature and Structure of Cooperative Democracy. viii. Explain the means to Achieving Good Working Relationship between the various organs of management xi. Explain the importance Measures to Make Democratic Control Effective x Explain the Operational Efficiency of Cooperatives, Performance Appraisal Concepts				
5	Teaching methods Lectures, sharing of materials via learning tools, <i>case studies, group work, individual presentations, and discussions</i>				

6	<p>Assessment methods</p> <p>Individual Presentations, Group Assignments, Continuous Assessment, Summative Assessment, Written end-of-the-semester examination</p> <p>This course will be graded as follows: Assignments 10%, Test(s) 20% Final Examination 70%</p>
7	<p>This module is used in the following degree programmes as well</p> <p>N/A</p>
8.	<p>Responsibility for module</p> <p>Prof. Adewale Oladapo Dipeolu</p>
9	<p>Other information</p> <p>1. Recommended materials</p> <p>i). Organization and Management of Consumers' Cooperative Associations and Clubs (with Model By-Laws) : Bulletin of the United States Bureau of Labor Statistics, No. 598</p> <p>ii) Cooperatives: Principles and practices in the 21st century by Cooperatives: by Kimberly A. Zeuli and Robert Cropp in 2004. Published by Madison, WI, University of Wisconsin</p> <p>iii) Cooperative Strategy: Economic, Business, and Organizational Issues by David Faulkner Mark de Rond . Oxford University Press (January 17, 2002).</p> <p>iv) Handbook on Cooperatives for use by Workers' Organizations by Guy Tchami. Published by the International Labour Organization</p>
	<p>2. Important Note</p> <p>This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote about 120 hours to learning of the course content, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using econometric software to analyse data). Hence, the course is of 4.0 ECTS credit equivalent.</p>

STUDENTS WORKLOAD AND COURSE DESCRIPTION (SECOND SEMESTER PhD. AgSE IN AGRICULTURAL ECONOMICS AND ENVIRONMENTAL POLICY PROGRAM

ADVANCED MICROECONOMICS THEORY, ANALYSIS AND APPLICATION					
Module code	Student workload	Credits	Semester	Frequency	Duration
AES 901	180 hours	6.0 ECTs	1 st . Sem.	One time in each First Semester	15 Weeks
1	Types of courses	Contact hours	Independent study	Class size	

	a) Class Work b) Seminars c) Students Term Papers Presentation	45 hours	135 hours	Avg of 10 (Max 30)
2	<p>Prerequisites for participation</p> <p>a) Participation in the course is compulsory for all students admitted for PhD.AgSE</p> <p>b) Participation is subject to confirmation of student registration for the course</p> <p>c) Familiarity with Microeconomics at the level of Varian, H. R.</p> <p>d) Intermediate Microeconomics. 8th edition. W. W. Norton, 2010.</p> <p>e) Familiarity with Mathematics at the level of Sydsaeter, Knut and Hammond, Essential Mathematics for Economic Analysis, Prentice Hall, 3rd ed., 2008.</p>			
3	<p>Learning outcomes</p> <p>By the end of the course the student will:</p> <p>1) be familiar with the main, unifying microeconomics principles and know how to analyse economic problems using the tools of microeconomics</p> <p>2) know the main concepts of consumer choice and firm behaviour, and their relevance for equilibrium and welfare analysis</p> <p>3) be able to identify market failure and evaluate economic policy with regard to efficiency and equity</p> <p>4) able to formulate, estimate, and test complete systems of consumer demand equations;</p> <p>5) be prepared to recognize situations of strategic interaction, as well as the methods to predict economic outcomes in those situations</p> <p>6) be familiar with expected utility theory for decision-making under uncertainty;</p> <p>7) know the limitations to economic policy</p> <p>8) know of possibilities and limitations to mechanism design in applied policy fields, such as auctions and matching.</p> <p>9) familiar with the literature of consumer demand applied to agricultural settings</p>			
4	<p>Subject aims/ Contents</p> <p>Consumer theory, Indirect utility, expenditure function and duality theory, revealed preference, measurement of household welfare due to price changes, consumer behavior under rationing, production and cost function, profit function and duality; theory of the firm and modelling, game theory, theory of market structure, Economics of regulation and deregulation, Economic choice under uncertainty, equilibrium analysis, review of methodology for economic analysis: direct and indirect functions; primal-dual approach; distance function; Static Econometric Models with Risk Aversion and Risk Neutrality; Models of Price Transmission, Time Series/Cointegration Models of Vertical and Spatial Price; Models of Choice in Dynamic Settings. Special topics in consumer theory such as labour supply, household production and intra-household allocation and welfare.</p>			
5	<p>Teaching methods</p> <p>Class lectures, case studies, field practical/group work, assigned readings and discussions.</p>			
6	<p>Assessment methods</p> <p>The course is evaluated through various combinations of methods : final examinations, term papers, and oral presentations, individual study and group work</p> <p>This course will be graded as follows: Assignments 10%, Test(s) 20%, Oral presentation 20% Final Examination 50%</p>			

7	<p>This module is used in the following degree programmes as well</p> <p>PhD Agricultural Economics and Farm Management, FUNAAB</p>
8.	<p>Responsibility for module</p> <p>Dr. Abiodun Elijah Obayelu</p>
9	<p>Other information</p> <p>1. Recommended materials</p> <p>a) Besanko, D. A., Braeutigam R. R and M. Gibbs (2011). Microeconomics. Fourth Edition, John Wiley & Sons, Inc</p> <p>b) Debertin, David L. (2012). "Applied Microeconomics: Consumption, Production and Markets". CreateSpace Independent Publishing Platform</p> <p>c). Garcia F. M, (2017). Advanced Microeconomic Theory: An intuitive Approach with examples. Published August, 2017</p> <p>d) Geoffrey, A. Jehle and Philip J. Reny (2011). Advanced microeconomic theory. Pearson Education Limited.</p> <p>e) Gravelle, R and Rees, R (2004). Microeconomics. 3rd` ed. London: Pearson. 2004</p> <p>f) Nicholson, W. (2007). Microeconomic Theory: Basic Principles and Extensions. 10th Edition. Thomson Learning 2007</p> <p>g) Olayemi J. K (2004): Principles of Microeconomics for applied economic analysis. Published bi SICO publishers, Ibadan, Nigeria</p> <p>h) Perloff J. M. (2013). Microeconomics: Theory and Application with Calculus</p> <p>i) Pindyck, R. and Rubinfeld, D(2005). Microeconomics. 6th ed. Pearson Prentice Hall, 2005.</p> <p>j) Waldman, Don E., 'Microeconomics', Pearson, Addison-Wesley, Boston, 2004.</p> <p>k) Ruey S. Tsay (2014). Multivariate Time Series Analysis With R and Financial Applications. John Wiley, New Jersey, 2014. ISBN 978-1-118-61790-8</p> <p>l) Varian H. R. (1992). Microeconomic analysis. Third Edition, Published by W. W. Norton & Company, USA</p>
	<p>2. Important Note</p> <p>This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned readings, personal studies, assignments, group work and hands-on practice using statistical software to analyse data and prepare the report). Hence, the course is of 6.0 ECTS credit equivalent.</p>

ADVANCED MACROECONOMICS THEORY, ANALYSIS AND APPLICATIONS
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Module code AES 902	Student workload 180 hours	Credits 6.0 ECTs	Semester 2 nd Semester	Frequency One in each Second Semester	Duration 15 Weeks
1	Types of courses a) Class Work b) Seminars c) Students Term Papers Presentation	Contact hours 45 hours	Independent study 135 hours	Class size Avg of 10 (Max 30)	
2	Prerequisites for participation a) Participation in the course is compulsory for all students admitted for PhD.AgSE b) Participation is subject to confirmation of student registration for the course c) This unit builds upon and extends the theoretical foundations laid in Intermediate macro-economics. It is expected that the students must have known the theoretical foundations in intermediate macro-economics				
3	Learning outcomes On successful completion of the course, students should be able to a) explain the various theories of consumption and savings and their applications b) explain investment and capital; the accelerator theory of investment; the marginal efficiency hypothesis and the relationships between Marginal Efficiency of Capital (MEC) and Marginal Efficiency of Investment (MEI) c) have knowledge of economic growth and agricultural growth models d) know the techniques for dynamic analysis in general equilibrium models e) better understanding of real business cycle models f) Apply models to analyze and interpret problems in macroeconomics such as the general or partial equilibrium model or the IS–LM framework g) Apply the models to interpret and analyze problems in macroeconomics h) display a knowledge of building and analysing macroeconomic models, including their strengths and weaknesses i) display a knowledge of macroeconomic approaches to modeling recessions, inflation and unemployment j) acquire a greater understanding of contemporary macroeconomic theory and policy				
4	Subject aims/ Contents The main aim of the course is to equip students with (a) an appreciation of the analytical skills needed in macroeconomics and (b) adequate and quantitative analytical skills needed to pursue careers in the both public and private sector. The contents include among others: Macroeconomic modelling to closed and open economy, Consumption, Saving and Income Determination, Investment Function, The IS-LM Framework, inflation and unemployment; economic growth analysis and growth theories/models, Macroeconomic theories and models relating to the determination of output, employment, and the price level within classical, neoclassical, and contemporary frameworks. Review of empirical evidences on the macroeconomics of agriculture.				

5	<p>Teaching methods</p> <p>Class lectures, case studies, field practical/group work, assigned readings and discussions.</p>
6	<p>Assessment methods</p> <p>The course is evaluated through various combinations of methods. Each unit contains self-assessment exercises, in addition to tutor-marked assignments (TMAs). Students will be assessed through final examinations, term papers, and oral presentations, individual study and group work</p> <p>This course will be graded as follows: Assignments 10%, Test(s) 20%, Oral presentation 20% Final Examination 50%</p>
7	<p>This module is used in the following degree programmes as well</p> <p>PhD Agricultural Economics and Farm Management, FUNAAB</p>
8.	<p>Responsibility for module</p> <p>Dr. Obayelu A. E.</p>
9	<p>Other information</p> <p>1. Recommended materials</p> <p>Alesina, A., Drazen, A., (1991): Why are Stabilizations Delayed? <i>The American Economic Review</i> 81(5), 1170-1188</p> <p>Anyanwu, J. C. and Oaikhenan, H. E. (1995): Modern Macroeconomics: Theory and Applications in Nigeria. Onitsha-Nigeria: Joanee Educational Publishers Limited</p> <p>Blanchard, O. J. and S. Fischer. (1989): Lectures on Macroeconomic, MIT Press.</p> <p>Burnside, C., Dollar, D., (2000). Aid, Policies, and Growth. <i>The American Economic Review</i>, 90(4), 847-868</p> <p>Borensztein, E., De Gregorio, J., Lee, J-W. (1998). How does foreign direct investment affect economic growth? <i>Journal of International Economics</i>, 45, 115-135</p> <p>Cooley, T. (1995): "Frontiers of Business Cycle Research", Princeton University Press.</p> <p>Clarida, R., G. J. and Mark G. (1999): The Science of Monetary Policy: A New Keynesian Perspective. <i>Journal of Economic Literature</i>, 37(4), 1661-1707.</p> <p>Campillo, M. and Miron, J., (1996). Why does inflation differ across countries? NBER working paper 5540, Cambridge MA</p> <p>Diamond, P. (1965): "National Debt in a Neo-Classical Growth Model," <i>American Economic Review</i>, 55, 1126-1150.</p> <p>Dornbusch, R., Stanley, F. and Startz, R. (1985): Macroeconomics: Concepts, Theories and Policies. New York: McGraw-Hill, Book Company</p> <p>Gali, J. (2008): Monetary Policy, Inflation, and the Business Cycle, , Princeton University Press.</p> <p>Gillman M. (2011): Advanced Modern Macroeconomics Analysis and Application, Prentice Hall .</p> <p>Jhinghan, M.L. (2003): Macro-Economic Theory. (11th ed.). VRINDAPublications (P) Limited.</p> <p>Kehoe, T. (1989): "Intertemporal General Equilibrium Models," in F. Hahn (ed.). The Economics of Missing Markets, Information and Games, Claredon Press, 363-393</p> <p>Ljungqvist, L. and T. J. Sargent (2006): Recursive Macroeconomic Theory", 2nd edition, MIT Press.</p> <p>Mortensen, D., Pissarides, C., (1999): Job allocation, employment fluctuations and unemployment. <i>Journal of Macroeconomics</i>, Chapter 18: 1171-1228</p> <p>Olson, O (2012): Essentials of Advanced Macroeconomic Theory, Routledge (2012).</p> <p>Parkin, M. (1982): Modern Macroeconomics. Ontario: Prentice-Hall, Canada Inc.</p> <p>Peter B. Sorensen and Hans J. Whitta-Jacobsen (2010): Introducing Advanced Macroeconomics: Growth & Business Cycles, 2nd edition, McGraw-Hill</p>

	<p>Rangarajan K. S. (1996): "A First Course in Optimization Theory". Cambridge University Press,</p> <p>Robert, J. B. and X. Sala-I-Martin (2003): "Economic Growth", 2nd edition, McGraw Hill,</p> <p>Romer, D. (2012): Advanced Macroeconomics, 4th edition, McGraw-Hill.</p> <p>Samuelson, P.A. (1958): "An Exact Consumption Loan Model of Interest, With or Without the Social Contrivance of Money, <i>Journal of Political Economy</i>, 66, 467-482.</p> <p>Sargent, T. J. (1987): Dynamic Macroeconomic Theory, Harvard Univ. Press.</p> <p>Solow, R., (1957). Technical Change and the Aggregate Production Function. <i>The Review of Economics and Statistics</i> 39(3) 312-320.</p> <p>Taylor, J., (1999): Staggered prices and wage setting in macroeconomics. <i>Journal of Macroeconomics</i>, Chapter 15: 1009-1050.</p> <p>Turnovsky, S. J. (2000): Methods of Macroeconomic Dynamics, 2nd edition, MIT Press.</p> <p>Williamson S. (2013): Macroeconomics, 4th Canadian Edition, Addison Wesley</p> <p>Wickens, M.(2008): Macroeconomic Theory, Princeton University Press (2008).</p>
	<p>2. Important Note</p> <p>This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned readings, personal studies, assignments, group work and hands-on practice using statistical software to analyse data and prepare the report). Hence, the course is of 6.0 ECTS credit equivalent.</p>

ADVANCED ECONOMETRIC METHODS					
Module Code: AES 903	Student workload	Credits (according to ECTS)	Semester	Frequency	Duration
	180 hours	6.0	First Semester	Once every academic session by the Second Semester	15 Weeks
1	Types of courses a) Class Work b) Hands-on Practical c) Students' Presentation	Contact hours 45 hours	Independent study 135 hours	Class size Avg. of 10 (Max 30)	
2	Prerequisites for participation Graduate-level knowledge of statistics, mathematical economics, and econometric methods, demonstrated by achieving at least 50% pass in relevant Master's level courses.				
3	Learning outcomes After the completion of this course, the Students will be able to: a) explain the theoretical basis and application of cutting-edge econometrics, b) apply various econometric techniques in data analysis and interpretation of results using econometric software (open / commercial) like SHAZAM, Stata, and R.				
4	Subject aims				

	<p>The aim of the module is to:</p> <ol style="list-style-type: none"> 1. expose students to cutting-edge econometric methods, working beyond the classical least square and Gauss-Markov theory; and 2. equip students with practical skills in econometric modelling, including use of software such as Stata, SHAZAM and R as to be able to carry out independent applied economic research, and publish the results in reputable economic journals. <p>Course Contents</p> <p>Review of the classical least square regression methods; heteroskedasticity, autocorrelation and the generalized least square methods; endogeneity, instrumental variables (IV) and two stage least square (2SLS) methods; seemingly unrelated regression (SUR); the maximum likelihood estimation method; nonlinear regression techniques; random regressors and moment-based estimation; Limited Dependent Variable Models; Simulation methods including parametric and nonparametric bootstrap methods.</p>
5	<p>Teaching methods</p> <p>Lectures; practical demonstrations; assigned reading, critique and replication (hands-on practice using local data) of econometric analysis in published economic papers; presentations and discussions.</p>
6	<p>Assessment methods</p> <p>Performance in the course will be assessed by a combination of assignments (10%), a Mid Semester Test (15%), a term paper (25%) and a final examination (50%). .</p>
7	<p>This module is used in the following degree programmes as well</p> <p>Ph.D. (Agricultural Economics)</p>
8	<p>Responsibility for module</p> <p>Prof. Adebayo M. Shittu and Dr Dare Akerele</p>
9	<p>Other information</p> <p>1. References</p> <ul style="list-style-type: none"> • Adkins, L.C. and Hill, R.C. (2011). Using Stata For Principles of Econometrics, 4th ed., John Wiley & Sons, Inc, New York. • Greene, W. H. (2012). Econometric Analysis, 7th ed., NJ: Prentice Hall (Pearson Educations, Inc.). • Hill, R.C., Griffiths, W.E. and Lim, G.C. (2011). Principles of Econometrics, 4th ed. John Wiley & Sons, Inc, New York. • Johnston, J. and DiNardo J. (1997). Econometric Methods, 4th ed. Singapore: McGraw-Hill. • Racine, J.S. (2019). Reproducible Econometrics Using R. Oxford University Press, Madison Avenue, New York. <p>2. Important Note</p> <p>This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote about 180 hours to learning of the course content, including participation in 45 hours of course lectures and demonstrations, and 135 hours</p>

of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using econometric software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent.

ADVANCED PRODUCTION ECONOMICS AND RISK MANAGEMENT						
Module code	Student workload	Credits	Semester	Frequency	Duration	
AES 904	120 hours	4.0 ECTS	2 nd Semester	One time in each second Semester	15 Weeks	
1	Types of courses a) Class Work b) Seminars c) Students' Presentation		Contact hours 30 hours	Independent study 90 hours	Class size Avg of 10 (Max 30)	
2	Prerequisites for participation Participation is subject to confirmation of student registration for the course					
3	Learning outcomes After the completion of this course, the Students will be able to: a) understand the economics of agricultural production economics and risk and uncertainty management b) understand the various theoretical perspectives in production economics and risk behaviours and analysis c) empirically estimate and interpret results of various agricultural production, technical efficiency and risk models d) Review/Critique articles in scholarly journals on topical issues in agricultural production economics.					
4	Subject aims 5. The aim of the course is to introduce students to concept, importance, standard theoretical and empirical models and application of advance production economics, and the principles and tools/ techniques for agricultural risk management and analysis Course Contents Components, assumptions, characteristics, short commings, estimations and economic interpretation of production functions such as linear, Spillman -Cobb Douglas, quadratic, multiplicative (power) functional forms - Translog, and transcendental functional forms -CES, production functional forms. Concepts of homogeneity, homotheticity, APP, MPP, elasticities of substitution and their economic relevance. Conceptual and empirical issues in specification, estimation and application of productional functions- Analytical approaches to economic optimum with production function analysis - input use behaviour, Decision making with multiple inputs and outputs, principles and importance of duality theory correspondence of production, cost, and profit functions, Estimation of cost function and interpretations, Factor demand (shares) estimation methods, Optimal product and input choice under multi-input and product enterptice settings, Estimation of factor shares from empirical functions estimated-Estimating production functions incorporating technology changes: Decomposition					

	analysis and incorporation of technology-Estimation of efficiency measures- Stochastic, probabilistic and deterministic frontier production functions, Risk programming - MOTAD-Quadratic programming-Simulation models for agricultural production decisions-Goal programming - Weighted, lexicographic and fuzzy goal programming-Compromise programming, Economic efficiency in agricultural production - technical, allocative and economic efficiency, measurement -Yield gaps analysis, Concepts, and measurement of Risk and uncertainty in agriculture, Assumption of Risk Analysis in Agriculture, Strategic risk management (different steps in managing risk), agricultural produce (crop) insurance, Incorporation of risk and uncertainty in decision making- risk and uncertainty and input use level-risk programming. Simulation and programming techniques in agricultural production, Multiple Course Objective Programming - Goal programming and Compromise programming - applications.
5	Teaching methods Lectures, sharing of materials via learning tools, global scenarios on agricultural topics, review of journal articles, practical data analysis and interpretations, group work, individual presentations, and discussions
6	Assessment methods Individual practical on data analysis, interpretation and discussion, presentations, Group Assignments, Continuous Assessment, Summative Assessment, Written end-of-the-semester examination Individual practical test/Assignments 40%, paper presentations (20%), Final Examination 40%
7	This module is used in the following degree programmes as well Post Graduate Programmes in Agricultural Economics in University of Florida, Angelo State, University, Pradesh University, Shimla
8	Responsibility for module Prof. C. A. Afolami
9	Other information a) References (1) Chambers RG. 1988. Applied Production Analysis. Cambridge Univ. Press. (2) Gardner BL & Rausser GC. 2001. Handbook of Agricultural Economics. Vol. IA Agricultural Production. Elsevier (3) Palanisami KP, Paramasivam & Ranganathan CR. 2002. Agricultural Production Economics: Analytical Methods and Applications. Associated Publishing Co (4) Debertin, D. L (2002). Agricultural Production Economics revised Second Edition. Macmillan Publishers (5) Applied Risk Management in Agriculture. Dana L. Hoag, editor. 2009. CRC Press, Taylor and Francis Group. ISBN-13: 978-1439809730. (6) Coping with Risk in Agriculture, Second Edition. J. B. Hardaker, R. B. M.Huirne, J. R. Anderson, and G. Lien. CABI publisher, 2004. ISBN-13: 978-0851998312 (7) Chambers, Robert G. 1980. Applied Production Analysis: A Dual Approach. New York: Cambridge University Press. (8) Moss, Charles B. 2015. Production Economics: An Empirical Approach Draft textbook online at http://ricardo.ifas.ufl.edu/aeb6184.production/ProductionBook.pdf . (9) Beattie, Bruce R. and C. Robert Taylor. The Economics of Production (New York: John Wiley & Sons, 1985). (10) Coelli, Timothy J., Dodla Sai Prasada Rao, Christopher J. O'Donnell, and George Edward Battese. An Introduction to Efficiency and Productivity Analysis (Springer, 2nd Edition, 2005). (11) Cornes, Richard. Duality and Modern Economics (New York: Cambridge University Press, 1992).

	<p>(13) Fare, Rolf and Daniel Primont. Multi-Output Production and Duality: Theory and Applications (Boston: Kluwer Academic Publishers, 1995).</p> <p>(14) Kumbhakar, Subal C. and C. A. Knox Lovell. Stochastic Frontier Analysis (New York: Cambridge University Press, 2003).</p> <p>(15) Shephard, Ronald W. Theory of Cost and Production Functions (Princeton, New Jersey: Princeton University Press, 1970).</p> <p>(16) Theil, Henri. The System-Wide Approach to Microeconomics (Chicago: Chicago University Press, 1980).</p> <p>(17) Doll, John P. and Frank Orazem. Production Economics: Theory with Applications Second Edition (Malabar, Florida: Krieger Publishing Company, 1984).</p>
	<p>2. Important Note</p> <p>This course is a 2-unit course based on the credit system in use in Nigeria. It is delivered through 30 hours of class lectures and demonstrations. Students are however, expected to devote a total of 120 hours of learning to the course, including participation in 30 hours of course lectures and demonstrations, and 90 hours of self-study (assigned readings, personal studies, assignments, group work and hands-on practice using statistical software to analyse data and prepare the report). Hence, the course is of 4.0 ECTS credit equivalent.</p>

ADVANCED STATISTICAL METHODS FOR ECONOMISTS					
Module Code: AES 905	Student workload 180 hours	Credits (according to ECTS) 6.0	Semester First Semester	Frequency Once every academic session by the First Semester	Duration 15 Weeks
1	<p>Types of courses</p> <p>a) Class Work</p> <p>b) Hands-on Practical</p> <p>c) Students' Presentation</p>	Contact hours 45 hours	Independent study 135 hours	Class size Avg of 10 (Max 30)	
2	<p>Prerequisites for participation</p> <p>Graduate-level knowledge of probability and statistics, mathematical economics, and econometric methods, demonstrated by achieving at least 50% pass in related courses at Masters level.</p>				
3	<p>Learning outcomes</p> <p>After the completion of this course, the Students will be able to:</p> <p>a) Explain the theoretical basis of statistical methods including approaches based on randomisation, modelling, statistical estimation & inference, simulations and Bayesian analysis, among others.</p> <p>b) Select and apply appropriate statistical techniques in research design and data analysis, and correctly interpret the results</p> <p>c) Expand the frontier of knowledge through evidence-based application of statistical methods.</p>				
4	<p>Subject aims</p>				

	<p>The aim of the module is to</p> <ol style="list-style-type: none"> 1. Equip students with sound knowledge of the theoretical basis and applications of a wide array of statistical methods including approaches based on randomisation, modelling, statistical estimation & inference, simulations and Bayesian analysis, among others. 2. Prepare students for a successful research career by building their practical skills in survey design, statistical modelling, data analysis and presentations. <p>Course Contents</p> <p>Review of foundational concepts and theories underlying sampling, statistical estimation and decision. Sampling and experimental approaches. Statistical abstractions, probability distributions and modelling, including additive error models, models based on response distribution, multiple random component models and stochastic processes. Statistical estimation and inference methods, including estimators based on sample moments, least squares, likelihood functions (maximum, modified and false likelihoods), and parametric bootstrap. Model assessment. Bayesian analysis and simulation methods. Hands-on experience working with statistical software and procedures based on various statistical methods.</p>
5	<p>Teaching methods</p> <p>Lectures, practical demonstrations, assigned readings of scientific publications applying various statistical methods, group work, individual presentations, and discussions.</p>
6	<p>Assessment methods</p> <p>Individual and Group Assignments, Quizzes, Course Project/Term Paper, and Written end-of-the-semester examination</p> <p>Assignments & Quizzes (20%), Course Project Report & Presentation (30%) and Final Examination (50%)</p>
7	<p>This module is used in the following degree programmes as well</p> <p>Ph.D. (Agricultural Economics)</p>
8	<p>Responsibility for module</p> <p>Prof Adebayo M. Shittu, Dr Dare Akerele and Dr Shakirat B. Ibrahim</p>
9	<p>Other information</p> <p>1. References</p> <p>a) DeGroot, M.H. and Schervish, M.J. (2012). <i>Probability and statistics</i> 4th ed., Pearson Education, Inc., Boston, USA.</p> <p>b) Di Ciaccio, A., Coli, M. and Ibañez, J.M.A. (2012). <i>Advanced Statistical Methods for the Analysis of Large Data-Sets. Studies in Theoretical and Applied Statistics (Selected Papers of the Statistical Societies)</i>, Springer-Verlag Berlin Heidelberg, London and New York.</p> <p>c) Field, A. (2013). <i>Discovering statistics using SPSS (4th edition)</i>. Sage Publishing, Los Angeles.</p> <p>d) Mark S. Kaiser, M.S. (2005). <i>Advanced Statistical Methods (Statistics 601)</i>, Department of Statistics, Iowa State University, Iowa.</p> <p>e) Schiller, J.J., Srinivasan, R.A. and Spiegel, M.R. (2013). <i>Schaum's Outline of Probability and Statistics</i>, 4th ed., McGraw-Hill, London.</p> <p>2. Important Note</p>

<p>This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned readings, personal studies, assignments, group work and hands-on practice using statistical software to analyse data and prepare the report). Hence, the course is of 6.0 ECTS credit equivalent.</p>
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RESEARCH METHODOLOGY AND DATA PROCESSING					
Module code	Student workload	Credits	Semester	Frequency	Duration
AES 906	180 Hours	6.0 ECTS	Second Semester	One time in each 2 nd Semester	15 Weeks
1	Types of courses a) Class work b) Hands-on Practical c) Students' Presentation	Contact hours 45 hours	Independent study 135 hours	Class size Avg. of 10 (Max 30)	
2	Prerequisites for participation a) Participation in the course is compulsory for all students admitted for PhD.AgSE b) Participation is subject to confirmation of student registration for the course c) Basic statistics, knowledge of computer and research methods				
3	Learning outcomes General Competence On successful completion of the course, students should be able to <ul style="list-style-type: none"> • has advanced knowledge of the research process • identify research problems from practical problems • Write research questions and hypotheses • has advanced knowledge of data collection techniques relative to their field of study • has advanced understanding of quantitative and qualitative methodologies and their applications Skills Upon successful completion of the course, the student will be able to: <ul style="list-style-type: none"> • construct a problem statement and evaluate it is soundness • utilise quality assurance techniques to create sound research proposals • construct and evaluate a methodology to answer the problem statement • apply statistical analysis and mathematical modelling techniques on data 				
4	Subject aims/ Contents The aim of this module is to develop theoretical, methodological and research skills of the students and enhance their ability to conduct rigorous research and reach to sound analytical conclusions. The contents of the course include: Data Processing File Management and Organization, Components of data processing, Methods of data processing, Application of statistical software and packages such as Statistical Package for Social Sciences (SPSS), EXCEL, Access, STATA, statistical software (R), D-BASE, SAS, Matlab, EViews - Statistical, forecasting, and modeling tools; GAMS or GEMPACK software systems				

5	<p>Teaching methods</p> <p>Group work, lectures, discussion, Scenario technique, practical demonstrations.</p>
6	<p>Assessment methods</p> <p>Continuous Assessment Tests, Home-works, term paper presentations, practical and examination</p>
7	<p>This module is used in the following degree programmes as well</p> <p>N/A</p>
8.	<p>Responsibility for module</p> <p>All Academic Supervisors on the programme</p>
9	<p>Other information</p> <p>1. Recommended materials</p> <ul style="list-style-type: none"> • Best, J. W. & Kahn, J. V. (2006). <i>Research in Education</i> (10th ed.). Boston, MA: Allyn & Bacon • Creswell, J. W. (2013). <i>Qualitative inquiry and research design: Choosing among five approaches</i> (3rd ed.). Thousand Oaks, CA: Sage. • Kwanchai A. Gomez, Arturo A. Gomez (1984): <i>Statistical Procedures for Agricultural Research</i>, 2nd Edition.. ISBN: 978-0-471-87092-0. Feb 1984. 704 pages • Kohl, M.(2015): <i>Introduction to statistical data analysis with R</i>. bookboon.com, London, 2015. ISBN 978-87-403-1123-5 • Kwanchai A. Gomez, Arturo A. Gomez (1984): <i>Statistical Procedures for Agricultural Research</i>, 2nd Edition.. ISBN: 978-0-471-87092-0. Feb 1984. 704 pages • Michael, J. D. (2018): <i>Statistical Analysis Handbook A Comprehensive Handbook of Statistical Concepts, Techniques and Software Tools</i>. 2018 edition. Published by The Winchelsea Press, Drumlin Security Ltd, Edinburg • Rahlf, T.(2017): <i>Data Visualisation with R</i>. Springer International Publishing, New York, 2017. ISBN 978-3-319-49750-1 • Rizzo, M (2008). <i>Statistical Computing with R</i>. Chapman & Hall/CRC, Boca Raton, FL, 2008. ISBN 9781584885450 • Sophia R. and Brian E. (2004): <i>A Handbook of Statistical Analyses using Stata by Third Edition</i>, CRC Press LLC • Wilcox, R. R. (2006): <i>Understanding and Applying Basic Statistical Methods Using R</i>. 1st Edition by. Published by Wiley, 2006 • Vikram D. (2015): <i>An Introduction to R for Quantitative Economics: Graphing, Simulating and Computing</i>. Springer, 2015. ISBN 978-81-322-2340-5. <p>2. Important Note</p> <p>This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote about 180 hours to learning of the course content, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using econometric software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent.</p>

ADVANCED NATURAL RESOURCE AND ENVIRONMENTAL ECONOMICS

Module code AES 907	Student workload 180 hrs	Credits (according to ECTS) 6.0 ECTS	Semester 1 st . Sem.	Frequency Each First Semester	Duration 15 Weeks
1	Types of courses a) Class Work b) Seminars c) Students' Presentation	Contact hours 45 hours		Independent study 135 hours	Class size Avg of 10 (Max 30)
2	Prerequisites for participation Participation is subject to confirmation of student registration for the course				
3	Learning outcomes After the completion of this course, the Students will be able to: a) consider and understand the argument that the environment sets limit to economic growth. b) understand the proximate drivers of the economy's impact on the environment – population, affluence and technology. c) understand the concept of sustainability from the economist, ecologist and from the institutional viewpoints. d) know the concept of market failure from environmental services provision and understand the basis for government intervention. e) understand how bargaining processes bring about efficient resource allocation and the attainment of efficient pollution outcomes without regulatory interventions. f) identify and understand pollution instruments available and the mechanism by which they operate to attain pollution targets. g) understand the ways international environmental problems differ from purely national or sub-national problems. h) learn the techniques of cost-benefit analysis and valuation as applied to natural resources and the environment. i) appreciate the ways in which natural resource use patterns are linked with sustainability. j) Understand the concept of non-renewable resource and the meaning of socially optimal depletion program and why within this context this differs from private optimal programs. k) compare resource depletion outcomes in competitive and monopolistic markets in the extraction of non-renewable resources. l) understand the idea of sustainable yield and the maximum sustainable yield in the analysis of renewable resources. m) understand various functions provided by forest and woodland resources. n) describe recent historical and current trends in forestation and deforestation.				

4	<p>Subject aims</p> <p>The aim of the module is to:</p> <ol style="list-style-type: none"> 1. Sensitize the students for active engagement in scientific and socio-economic discourses and practices that inculcate environmentally-friendly considerations into development projects planning and executions for assurance of sustainability. 2. Create awareness in the students of the existence of market failure – inefficiency in resource allocation in environmental services provision and the need for government intervention for attainment of social optimality in its consumption. 3. Emphasize in the students the need to imbibe the culture of “sustained yield” and “sustained maximum yield” in natural resources extraction to protect future intergenerational rights. 4. Sharpen the knowledge and skills of students in environmental project appraisal and valuation and sensitize them on how policies emanate from these outcomes. <p>Course Contents</p> <p>Introduction to Natural Resource and Environmental Economics – A Review; The origin and concept of sustainability; Welfare economics and the environment; Pollution control: targets; Pollution control instruments; International environmental problems; Project Appraisal: Cost-benefit analysis; Valuing the environment; The efficient and optimal use of natural resources; The theory of optimal resource extraction: non-renewable resources; Renewable resources; Forest resources.</p>
5	<p>Teaching methods</p> <p>Lectures, sharing of materials via learning tools, global scenarios on agricultural topics, case studies, group work, individual presentations, and discussions</p>
6	<p>Assessment methods</p> <p>Individual Presentations, Group Assignments, Continuous Assessment, Summative Assessment, Written end-of-the-semester examination</p> <p>Individual Assignments 10%, Test(s) 10%, Policy paper presentation (10%), Final Examination 70%</p>
8	<p>Responsibility for module</p> <p>Prof. Luke O. Okojie</p>
9	<p>Other information</p> <p>a) References</p> <p>(1) Arrow, K., R. Solow, E. Leonor, P. Portney, and H. Schuman (1993). Report of the NOAA Panel on Contingent Valuation, National Oceanic and Atmospheric Administration, Federal Register, Vol. 8, No. 10, 4602-4614.</p> <p>(2) Baumol, W. J. and Blinder, A. S. (1982). Economics: Principles and Policy, 2nd Edition, Harcourt Brace Jovanovich, Inc.</p> <p>(3) Bockstael, N. E., K. E. McConnel, I. E. Strand (1991). <i>Recreation</i>. In: Broden, J.B. and C. D. Kolstad (eds) (1991): Measuring the Demand for Environmental Quality, Amsterdam Publishers B.V. (North Holland), 227-270.</p>

	<p>(4) Desvougues, W. H., F. R. Johnson, R. W. Dunford, S. P. Hudson, K. N. Wilson (1993). <i>Measuring Natural Resource Damages with Contingent Valuation: Tests of Validity and Reliability</i>, in Hausman, J. A. (ed): Contingent Valuation: A Critical Assessment, Elsevier Science Publishers B.V. (North-Holland), 909-990.</p> <p>(5) Eccleston, Charles H. (2010). <i>Global Environmental Policy: Concepts, Principles, and Practice</i>. ISBN 978-1439847664.</p> <p>(6) "Environmental Policies and Instruments" http://www.oecd.org/departement/03355en2649_342811111100.html</p> <p>(7) Hanemaan, M. W. (1994). Valuing the Environment through Contingent Valuation, The Journal of Economic Perspectives, (8): 19-44.</p> <p>(8) Hanemaan, M. W. (1991). Willingness To Pay and Willingness To Accept: How much can they Differ? The American Economic Review, (81): 635-647.</p> <p>(9) Hammon, P. (1990). Theoretical Progress in Public Economics: A Provocative Assessment, Oxford Economic Papers, (42): 6-33.</p> <p>(10) "Instrument Mixes for Environmental Policy" (Paris: OECD Publications, 2007) 15–16.</p> <p>(11) Johansen, Per-Olov (1993). Cost-Benefit Analysis of Environmental Change, Cambridge: Cambridge University Press.</p> <p>(12) Roger Perman, Yua Ma, Jamees McGilvaray and Michael Common (1996). Natural Resource and Environmental Economics, 3rd Edition, Pearson Addison Wesley.</p> <p>(13) Scott, S. (1997). 'Agriculture and forestry', Chapter 4 in Barrett, A., Lawlor, J. and Scott, S. The Fiscal System and the Polluter Pays Principle, Aldershot, Ashgate. ARTS 363.73 N73.</p> <p>(14) Reinout Heijungs, Benjamin Sprecher, Arnold Tukker, Laura Scherer^a Paul Behrens (2018). Trade-offs between social and environmental Sustainable Development Goals, <i>Environmental Science and Policy</i>, Vol. 90: 65-72.</p>
	<p>Important Note:</p> <p>This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned readings, personal studies, assignments, group work and hands-on practice using statistical software to analyse data and prepare the report). Hence, the course is of 6.0 ECTS credit equivalent.</p>

ADVANCED MATHEMATICS FOR ECONOMISTS						
Module code AES 908	Student workload 180 hours	Credits 6.0 ECTS	Semester Second Semester	Frequency One time in each Semester	Duration 15 Weeks	
1	Types of courses a) Class Work b) Seminars c) Students' Presentation	Contact hours 30hours	Independent study 90 hours	Class size (Potential) Avg. of 10 (Max 30)		
2	Prerequisites for participation Basic knowledge of economics theory, concepts and principles; mathematics and research methods at the lower level degrees.					
3	Learning outcomes After the completion of this course, the Students will: a) have mastered the fundamentals of mathematical techniques application to economic problems; b) be able to competently interpret results of economic models and analysis.					
4	Subject aims The aim of the module is to make students to be self-sufficient in: 3. skills required for formulating mathematical models on economic phenomena based on economic concepts, theories and principles using appropriate mathematical techniques; 4. hypotheses formulation for economic models and data analysis; 5. analytical result interpretation and statistical inferences using appropriate methods. Course Contents a. Brief review of functions, equations, derivatives and rules of differentiation. b. Calculus of multivariable (constrained optimization - the Langragian multiplier). c. Differentiation of exponential and logarithmic functions. d. Matrix algebra: i. special determinants and matrices (the Jacobian, the Hessian, the discriminant), ii. constrained optimization, iii. characteristic Roots and Vectors, iv. transformation matrix. e. Mathematical programming: i. Linear Programming (review of graphic solution and simplex algorithm approaches, the primal-dual, degeneracy), ii. Integer Programming, iii. Non-linear Programming					

	<ul style="list-style-type: none"> iv. Dynamic Programming. v. the Theory of Games). f. The definite integral and probability (probability density function and normal distribution). g. Second-order differential and Difference equations. h. Control Theory and static optimization theory (Theory of competitive markets, existence and stability analysis).
5	<p>Teaching methods</p> <p>Lectures, material sharing via learning tools, case studies, group work, individual presentations and discussions</p>
6	<p>Assessment methods</p> <p><i>Components:-</i> Individual Presentations, Group Assignments, Academic Paper Preparation <i>Grading scale:-</i> Individual Presentation 30%, Group Assignments 10%, Academic Paper 60%</p>
7	<p>This module is used in the following degree programmes as well</p> <p>N/A</p>
8	<p>Responsibility for module</p> <p>Dr. SANUSI Rahman Akintayo</p>
9	<p>Other information</p> <p>1. Suggested Further Readings</p> <ul style="list-style-type: none"> a) Barrow, M. (2006). Statistics for Economics, Accounting and Business Studies. Fourth edition. Published by Pearson Education Limited, Edinburgh, England, UK. 415pp. (b) Carl, C. P. and Blume, L. (1994). Mathematics for Economists. Published by W. W. Norton and Company, New York, USA. 899pp. (c) Chiang, A. C. and Wainwright, K. (2005). Fundamental Methods of Mathematical Economics. Fourth edition. Published by McGraw-Hill Inc, New York, USA. 701pp. (d) Dowling, E. T. (1992). Introduction to Mathematical Economics. Schaum's Outline Series of Theory and Problems. Second edition. Published by McGraw-Hill Inc, New York, USA. 485pp. (e) Francis, A. (2004). Business Mathematics and Statistics. Sixth edition. Published by Thomson, Birmingham, UK. 92pp. (f) Gulati, B. R. (1978). College Mathematics with Applications to the Business and Social Sciences. Published by Harper & Row, Pennsylvania, USA. 334pp (g) Jacques, I. (2006). Mathematics for Economics and Business. Fifth edition. Published by Pearson Education Limited, Edinburgh, England, UK. 694pp. (h) Kwak, N. K. (1973). Mathemathecal Programming with Business Application. Published by McGraw-Hill Inc, New York, USA. (i) Rosser, M. (2003). Basic Mathematics for Economists Second Edition. Routledge, New York, USA. 535pp. (j) Wheeler, R. E. and Peebles, W. D. (1975). Modern Mathematics with Applications to Business and the Social Sciences. 2nd edition. Published by Brooks/Cole Publishing Company, Pennsylvania, USA. 607pp. (k) Werner, F. and Sotskov, Y. N. (2006). Mathematics of Economics and Business. First edition. Routledge, New York, USA. 537pp.
	<p>2. Important Note</p>

<p>This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote about 180 hours to learning of the course content, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using econometric software to analyse data). Hence, the course is of 6.0 ECTS credit equivalent.</p>

ADVANCED QUANTITATIVE METHODS IN ENVIRONMENTAL ECONOMICS					
Module code	Student workload	Credits (according to ECTS)	Semester	Frequency	Duration
AES 909	180 hours	6.0 ECTS	1 st . Sem.	Each First Semester	15 Weeks
1	Types of courses a) Class Work b) Seminars c) Students' Presentation	Contact hours 45 hours	Independent study 135 hours	Class size Avg of 10 (Max 30)	
2	Prerequisites for participation Basic knowledge of statistics, Econometrics, mathematics, and Research methods, Environmental Economics at the Master Level				
3	Learning outcomes After the completion of this course, the Students will: a) Understand the basic econometric techniques b) Be able to apply various econometric techniques with proper interpretation of their results				
4	Subject aims The aim of the module is to 1. The main objective of this course is to provide an advanced treatment of the economic theory of environmental economics, management and policy, externalities and market and non-market approaches to environmental improvement. Topics in economic growth and environmental problems, poverty and environmental degradation, conservation and sustainable economic growth, intergenerational and global environmental problems, policy issues in environmental regulation and management will be covered at a sufficient depth so as to equip the students with the recent developments in the field. 2. Course Contents Natural resources - definition - characteristics and classification. Stock dynamics of renewable and non-renewable resources. Equation of motion for renewable and non-renewable resources. Fundamental equation of renewable resources and their derivations. Estimation of Growth curves and stock of fishery and forest resources. The role of time preference in natural resource use. Simple two-period model of optimal use of renewable and non-renewable resources. Advanced models of optimal resource use - Static Vs. dynamic efficiency in natural resource use, Applications of dynamic programming and optimal control. Economics of groundwater use - optimal extraction of groundwater. Analytical and numerical solutions for optimal inter-				

	temporal allocation of natural resources. Optimal harvesting of single rotation and multiple rotation forests. Optimal management of fishery. Property rights in natural resources and their implication for conservation and management of natural resources. Multi-period dynamic efficiency - Using software in solving dynamic natural resource harvesting problems. Using analytical solution procedures for solving natural resource management problems -Optimal control. Management of common property natural resources - Institutional arrangements for conservation and management of common pool fishery, groundwater and forestry resource. Resource scarcity - Natural resource degradation - Poverty and resource degradation - Natural resource accounting - Pricing and valuation of natural resources - Natural resources policy. Environment in macroeconomic modeling - Meta-analysis, economic valuation and environmental economics - Multi-criteria methods for quantitative, qualitative and fuzzy evaluation problems related to environment - Input output analysis, technology and the environment - Computable general equilibrium models for environmental economics and policy analysis. Choice Experiments and, environmental valuation approaches/Methods and emperics.
5	Teaching methods Lectures, sharing of materials via learning tools, review of journal articles, practical data analysis and interpretations, group work, individual presentations, and discussions
6	Assessment methods Individual practical on data analysis, interpretation and discussion, presentations, Group Assignments, Continuous Assessment, Summative Assessment, Written end-of-the-semester examination Individual practical test/Assignments 40%, paper presentations (20%), Final Examination 40%
7	This module is used in the following degree programmes as well Post Graduate Programmes in Agricultural Economics in University of Florida, Angelo State, University, Pradesh University, Shimla
8	Responsibility for module Prof. S. A. Adewuyi
9	Other information 1. References a) Carlson GA, Miranowski J & Zilberman D. 1998. Agricultural and Environmental Resource Economics. Oxford Univ. Press. b) Hanley N, Shogren J & White B. 2007. Environmental Economics in Theory and Practice. Palgrave, London. c) Kolstad C. 1999. Environmental Economics. Oxford Univ. Press. Prato T. 1998. Natural Resource and Environmental Economics. Iowa State Univ. Press. d) Sterner T. 2003. Policy Instruments for Environmental and Natural Resource Management. Resources for the Future. The World Bank and SIDA. e) J. McGilvray and M. Common, Natural Resource and Environmental Economics, Pearson Addison Wesley, Fourth Edition (2011), and Third Edition (2003); Conrad, f) J., Resource Economics, Cambridge: Cambridge University Press, (2005); g) Kolstad, C., Environmental Economics, Oxford: Oxford University Press,

	<p>Note:</p> <p>This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned readings, personal studies, assignments, group work and hands-on practice using statistical software to analyse data and prepare the report). Hence, the course is of 6.0 ECTS credit equivalent.</p>
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ADVANCED MATHEMATICS FOR ECONOMISTS					
Module code AES 911	Student workload 180 hours	Credits 6.0 ECTS	Semester 1 st . Sem.	Frequency One time in each First Semester	Duration 15 Weeks
1	<p>Types of courses</p> <p>a) Class Work</p> <p>b) Seminars</p> <p>c) Students' Presentation</p>	Contact hours 45 hours	Independent study 135 hours	Class size (Potential) Avg of 10 (Max 30)	
2	<p>Prerequisites for participation</p> <p>Basic knowledge of economics theory, concepts and principles; mathematics and research methods at the lower level degrees.</p>				
3	<p>Learning outcomes</p> <p>After the completion of this course, the Students will:</p> <p>a) have mastered the fundamentals of mathematical techniques application to economic problems;</p> <p>b) be able to competently interpret results of economic models and analysis.</p>				
4	<p>Subject aims</p> <p>The aim of the module is to make students to be self-sufficient in:</p> <p>6. skills required for formulating mathematical models on economic phenomena based on economic concepts, theories and principles using appropriate mathematical techniques;</p> <p>7. hypotheses formulation for economic models and data analysis;</p> <p>8. analytical result interpretation and statistical inferences using appropriate methods.</p> <p>Course Contents</p> <p>e. Brief review of functions, equations, derivatives and rules of differentiation.</p> <p>f. Calculus of multivariable (constrained optimization - the Langragian multiplier).</p> <p>g. Differentiation of exponential and logarithmic functions.</p> <p>h. Matrix algebra:</p> <p>v. special determinants and matrices (the Jacobian, the Hessian, the discriminant),</p>				

	<ul style="list-style-type: none"> vi. constrained optimization, vii. characteristic Roots and Vectors, viii. transformation matrix. i. Mathematical programming: <ul style="list-style-type: none"> vi. Linear Programming (review of graphic solution and simplex algorithm approaches, the primal-dual, degeneracy), vii. Integer Programming, viii. Non-linear Programming ix. Dynamic Programming. x. the Theory of Games). j. The definite integral and probability (probability density function and normal distribution). k. Second-order differential and Difference equations. l. Control Theory and static optimization theory (Theory of competitive markets, existence and stability analysis).
5	<p>Teaching methods</p> <p>Lectures, material sharing via learning tools, case studies, group work, individual presentations and discussions</p>
6	<p>Assessment methods</p> <p><i>Components:-</i> Individual Presentations, Group Assignments, Academic Paper Preparation</p> <p><i>Grading scale:-</i> Individual Presentation 30%, Group Assignments 10%, Academic Paper 60%</p>
7	<p>This module is used in the following degree programmes as well</p> <p>N/A</p>
8	<p>Responsibility for module</p> <p>Dr. SANUSI Rahman Akintayo</p>
9	<p>Other information</p> <p>1. Suggested Further Readings</p> <ul style="list-style-type: none"> a) Barrow, M. (2006). Statistics for Economics, Accounting and Business Studies. Fourth edition. Published by Pearson Education Limited, Edinburgh, England, UK. 415pp. (b) Carl, C. P. and Blume, L. (1994). Mathematics for Economists. Published by W. W. Norton and Company, New York, USA. 899pp. (c) Chiang, A. C. and Wainwright, K. (2005). Fundamental Methods of Mathematical Economics. Fourth edition. Published by McGraw-Hill Inc, New York, USA. 701pp. (d) Dowling, E. T. (1992). Introduction to Mathematical Economics. Schaum's Outline Series of Theory and Problems. Second edition. Published by McGraw-Hill Inc, New York, USA. 485pp. (e) Francis, A. (2004). Business Mathematics and Statistics. Sixth edition. Published by Thomson, Birmingham, UK. 92pp.

- (f) Gulati, B. R. (1978). College Mathematics with Applications to the Business and Social Sciences. Published by Harper & Row, Pennsylvania, USA. 334pp
- (g) Jacques, I. (2006). Mathematics for Economics and Business. Fifth edition. Published by Pearson Education Limited, Edinburgh, England, UK. 694pp.
- (h) Kwak, N. K. (1973). Mathemathecal Programming with Business Application. Published by McGraw-Hill Inc, New York, USA.
- (i) Rosser, M. (2003). Basic Mathematics for Economists Second Edition. Routledge, New York, USA. 535pp.
- (j) Wheeler, R. E. and Peebles, W. D. (1975). Modern Mathematics with Applications to Business and the Social Sciences. 2nd edition. Published by Brooks/Cole Publishing Company, Pennsylvania, USA. 607pp.
- (k) Werner, F. and Sotskov, Y. N. (2006). Mathematics of Economics and Business. First edition. Routledge, New York, USA. 537pp.

2. Important Note:

This course is a 3-unit course based on the credit system in use in Nigeria. It is delivered through 45 hours of class lectures and demonstrations. Students are however, expected to devote a total of 180 hours of learning to the course, including participation in 45 hours of course lectures and demonstrations, and 135 hours of self-study (assigned readings, personal studies, assignments, group work and hands-on practice using statistical software to analyse data and prepare the report). Hence, the course is of 6.0 ECTS credit equivalent.

ADVANCED TOPICS IN AGRICULTURAL ECONOMICS AND ENVIRONMENTAL POLICY ANALYSIS					
Module code	Student workload	Credits	Semester	Frequency	Duration
AES 910	45 hours	1.5 ECTS	Second Semester	One time in each Semester	15 Weeks
1	Types of courses a) Hands-on Practical b) Seminars c) Students' Presentation	Contact hours 30hours	Independent study 45 hours	Class size (Potential) Avg. of 5	
2	Prerequisites for participation Basic knowledge of Agricultural Economics and Environmental Policy Analysis				
3	Learning outcomes After the completion of this course, the Students will: a) have mastered some basic concepts, theories in the field of Environmental and agricultural Economics				
4	Subject aims The aim of the module is to increase the general competence and the skill of the students in their area of focus Course Contents Covers all areas in the speciality area of the study				
5	Teaching methods Global Scenario method of identifying topics, case studies, presentations and discussions				
6	Assessment methods <i>Components:-</i> Academic Paper Preparation <i>Grading scale:-</i> Presentation 50%, Academic Paper 50%				
7	This module is used in the following degree programmes as well N/A				
8	Responsibility for module Academic Supervisors				
9	Other information 1. Suggested Further Readings Relevants journal papers, reports, bboks in the students specialty area.				
	2. Important Note This course is a 1-unit course based on the credit system in use in Nigeria. It is delivered through 20 hours of class lectures and demonstrations. Students are however, expected to devote about 45 hours to learning of the course content, including participation in 20 hours of course lectures and demonstrations, and 45 hours of self-study (assigned reading, personal studies, assignments, group work and hands-on practice using econometric software to analyse data). Hence, the course is of 1.5 ECTS credit equivalent.				

