YEAR 2

SEMESTER 1

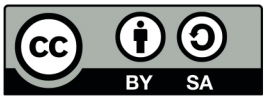
Four-Year B.Ed. Course Manual

TVET - HISTORIAL DEVELOPMENT TOOLS AND MATERIALS IN AGRICULTURE

GHANA TERTIARY EDUCATION COMMISSION

NATIONAL TEACHING COUNCIL
NTC
Building Confidence, Raising Teaching Standards

The Government of Ghana



FOREWORD

These Initial Teacher Education course manuals were developed by a team consisting of members from Colleges of Education and four universities namely the University of Ghana, Kwame Nkrumah University of Science and Technology, University of Education, Winneba, and University for Development Studies. This team was originally constituted by the National Council for Tertiary Education (now the Ghana Tertiary Education Commission) in 2019 to support the delivery of the new B.Ed. curriculum with assistance from T-TEL and UK Aid. The revision, finalization and printing of these manuals took place in 2021 with support from T-TEL and Mastercard Foundation.

The course manuals have been produced for use as general guides for the delivery of the new four-year B.Ed. curriculum in Colleges of Education in collaboration with their affiliated universities. They are designed to support student teachers, tutors and lecturers in delivering a complete B.Ed. course for training student teachers which meet the requirements of the National Teachers' Standards, enabling them to teach effectively in basic schools.

The first section of the manuals is focused on the course information and vision for the B.Ed. curriculum. The second section presents the course details, goal for the subject or learning area, course description, key contextual factors as well as core and transferable skills and cross-cutting issues, including equity and inclusion. The third section is a list of course learning outcomes and their related learning indicators. The fourth section presents the course content which is broken down into units for each week, the topic and sub-strands and their related teaching and learning activities to achieve the learning outcomes and the teaching and learning strategies. This is followed by course assessment components in section five. Each manual contains a list of required reading and references as well as teaching and learning resources. The final section presents course related professional development for tutors and lecturers to be able to use each section of the manual.

Field instructions to guide Supported Teaching in School are integrated into the course manuals to provide the student teacher with guidance in developing teaching throughout the entire period of study to be able to meet the requirements of the National Teachers' Standards (NTS) and the National Teacher Education Curriculum Framework (NTECF). To ensure maximum benefit the course manuals should be used in addition to other resources such as the NTS, NTCEF, National Teacher Education & Assessment Policy and the National Teacher Education Gender Equality and Social Inclusion (GESI) Strategy and Action Plan. This will help to ensure that student teachers learning is integrated within the wider teacher education policy framework.

Professor Mohammed Salifu Director General, Ghana Tertiary Education Commission

ACKNOWLEDGEMENTS

The course manuals were developed through the collaborative efforts of a team of individuals from Colleges of Education, University of Ghana, Kwame Nkrumah University of Science and Technology, University of Education, Winneba and University for Development Studies. They were produced in association with the Ghana Tertiary Education Commission of the Ministry of Education, Ghana.

A participatory team approach was used to produce these sets of resources for tutors/lecturers, mentors and student teachers. We are grateful to the specialists who contributed their knowledge and expertise.

Special thanks to Professor Jophus Anamuah-Mensah - T-TEL Key Advisor, Dr. Eric Daniel Ananga T-TEL Key Advisor for Curriculum reform and Beatrice Noble-Rogers who provided key editorial, review and content input and facilitated the process of drafting and finalising the course manual.

Patricia Appiah-Boateng and Gameli Samuel Hahomene, served as typesetting and formatting coordinators and designed and produced the illustrations, tables and other graphics which appear in the pages. They spent time and effort designing and redesigning the graphic layout and producing the camera-ready copies resulting in a set of materials that are easy to use, read and reference.

Thanks also goes to all T-Tel staff members who worked to support production of these course manuals, particularly Beryl Opong-Agyei and Gideon Okai. Their frankness and co-operative attitude complimented the team is approach used to produce these manual.

We are indebted to the Ministry of Education and the Ghana Tertiary Education Commission (GTEC) for the general support and specific helpful advice provided during production of the course manuals. Recognition and thanks must go to Chief Technical Advisor for T-TEL and Policy Advisor to the National Education Reform Secretariat, Akwasi Addae-Boahene, Prof. Mohammed Salifu, the Director General of GTEC and Mr. Jerry Sarfo the coordinator for the colleges of education, who in diverse ways supported during the course manual writing workshops.

In addition to all the staff who participated visibly in the development of these materials we would like to acknowledge all those people from the many colleges of education and universities in which we have worked and who have directly or indirectly, shared their views on the curriculum with us.

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INTRODUCTION TO COURSE MANUALS

Welcome to this B.Ed. Course manual.

Following the accreditation of the B.Ed. by the national accreditation Board with its recognition as a world class teacher education curriculum, the decision was taken to support effective implementation through the development of course manuals. the course manuals provide tutors and lecturers with the materials necessary to support teaching each of the B.Ed. courses. The manuals adhere directly to, and emphasise, the principles and standards set out in the NTS, NTECF and in the B.Ed. and will help ensure operationalising the Government's teacher education reform Policy.

The manuals serve the following purposes:

- they are the key educational agreements between the training institution and the student teachers. In this way student teachers know what the expectations are for them and for the training they will receive.
- they lay out the course outcomes, content, strategies, and assessment, thereby providing direction to and consistency in training and B.Ed. implementation among tutors across the country.
- they are explicit documents that provide other institutions with information on which to base transfer/ articulation decisions.

Specifically, they also:

- support coherent lesson planning and teaching which will enable student teachers to achieve the NTS and become good teachers who ensure all pupils' learning whilst offering tutors the flexibility for adaptation for local needs and contexts.
- Provide a lesson by lesson overview of the course, building on and developing the material in the course specifications.
- Inform tutors, student teachers and others working with student teachers about:
    1. What is to be taught and why.
    2. how it can be taught.
    3. how it should be assessed.
- Provide opportunities for student teachers to develop and apply knowledge during supported teaching in school, creating a strong bond between learning in school and in the training institution.
- Reflect the stage of student teacher development, set out in the model for progress across the four years of the B.Ed.
- Can be used as self-study tools by student teachers.
- Ensure that all information necessary to inform teacher training is in one place (serves as reference document).
- The manuals are the basis of the codes and university professional development sessions to ensure Principals, tutors, lecturers and heads of department are fully familiar with the details of: courses, outcomes, content, approaches, assessments and lessons.

Who are course manuals for:

- College of Education Tutors
- Teacher Education University Lecturers
- Student Teachers
- Mentors and Lead Mentors
- All Those with An Interested In Teacher Education.

USING THIS MANUAL

Writers of the manuals engaged widely with colleagues in each subject area at each stage of development. Besides, writers envisaged themselves in varied contexts as they wrote, to suggest methodologies and strategies for teaching the strands which would ensure student teachers are enabled to achieve the learning outcomes. In view of our commitment to creativity, problem solving, collaboration and to lifelong learning, we expect that individual tutors will "own" their manuals and become user-developers. lessons in the manuals will be strands for weekly Pd meetings where tutors/lecturers will situate the lessons in the contexts of their colleges and their student teachers, to maximize the benefits.

It is also expected that tutors will model the best pedagogic practices for student teachers. Key among such practices is the communication of the importance of having a personal teaching philosophy. We expect that tutors and lecturers will explicitly communicate their personal teaching philosophies to their student teachers during the first meeting of every course. in preparation for this, we suggest you set out your personal teaching philosophy and how it will be demonstrated in your teaching using, or adapting, the sample sentence introductions below.

My teaching philosophy is ……..

In view of this philosophy, I will facilitate this course by/through ……

A.Course information

Title Page

Historical Development, Tools And Materials in Agriculture

i. The vision for the New Four-Year B.Ed. Curriculum

''To transform initial teacher education and train highly qualified, motivated new teachers who are effective, engaging and fully prepared to teach the basic school curriculum and so improve the learning outcomes and life chances of all learners they teach as set out in the National Teachers' Standards. In doing this to instil in new teachers the Nation's core values of honesty, integrity, creativity and responsible citizenship and to achieve inclusive, equitable, high quality education for all learners. ''

i. Course Details: as in course specification unless important reason why not

Pre-requisite/s	**WASSCE/SSSCE/Diploma in Agriculture.**					
Co-Requisites	**Links to other courses being taught, support coherence in student experience and avoid duplication**					
Course Level		**Course Code**		**Credit Value**		

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1. Goal for the Subject or Learning Area

Students will be introduced to how agriculture was developed from foundational and philosophical history. They will also be exposed to simple manipulative skills of tools, equipment and machines.

2. Key contextual factors

Ghana is a developing country with high unemployment, especially among the youth. This unemployment situation could be addressed by designing and implementing well-structured agricultural programmes. However, to succeed in designing and implementing a well- structured agricultural programme, there are a number of barriers that must be considered. Notable among them is the issue of general lack of infrastructure, logistics and insufficient funding to support the sector. Workshops and farms to facilitate agricultural programmes are inadequate, outmoded and in many instances non-existent. In the first year student teachers were introduced to the general TVET domains. In the second year student teachers are expected to be introduced to a more specialised area in agriculture as one of the TVET domains.

3. *Course Description*

This course is designed for the student teacher to concentrate on the domain of his/her specialization in Agriculture, interacting with relevant foundational history, philosophies and concepts in agriculture; explore the nature of relevant tools and materials through guided demonstrations and simulations of foundational manipulative processes/skills (nursing, pricking out, stumping, weeding, drying, feeding, health care, etc.) either in whole or in part using non-sophisticated materials and tools (preferably hand tools - cutlass, hand trowel, hand fork, shears, burdizzo, hoof cutter, secateurs, etc.) Student teacher is supposed to observe classroom and wider school activities. Student teacher will
reflect on experiences in his/her school placement and apply concept in agriculture, plan and address some of the issues of diversity, inclusivity and access. Student teacher is to build portfolio reflecting understanding of his/her learning environment, showing growing comprehension and application of concepts of inclusivity, equity, access for all student teachers irrespective of ability, gender or socioeconomic status and cultural background. The reflection on student teacher's professional practice must also encompass the national value of honesty, critical thinking and integrity. This adequately prepares the student teacher to finally settle on his/her area of specialization within the Agriculture sub-domains. This course shall be delivered by using face to face interaction between the tutor and student teachers, practical activities, seminars and e-learning. Student teachers shall be assessed on portfolio, report writing, observations, reflective practice, written examination and test. Written examination and test shall form only 30% of the assessment. (*NTS 3e; p. 24; NTECF p. 27;* (*NTECT p18, 21, 28; NTS 14i, p11;NTS 1f, p.19*; *NTECF p. 33)*

4. *Core and transferable skills and cross cutting issues, including equity and inclusion*

Core and transferable skills: Problem-solving skills (CLO1,2,3,4), personal motivation (CLO1, 2,3,4,5) civic literacy, team-work/ collaborative skills, analytical skills, critical thinking, creative and innovative skills, inquiry (CLO1-5).
Cross-cutting issues: Gender, equity and inclusivity, professional attitudes and values, assessment strategies, action research, reflective thinking

This can be found in the course specification. Which core and transferable skills or cross cutting issues will be applied or developed through this course? This needs to be made explicit to student teachers. Are there specific issues to do with equity and inclusion which must be addressed so that all student teachers can fully take part? For example, issues related to gender and mathematics or science.

5. Course Learning Outcomes	*6. Learning indicators*
By the end of the course, Students teachers will be able to: CLO.1 demonstrate understanding of theories and principles underlining various processes/skills and their respective sequences in practical skills development and acquisition (*NTS 3e; p. 24; NTECF p. 27*)	1.1 Develop a desk study report on historical development of agriculture in Ghana. 1.2 Make a video on manipulation of simple tools and handling of basic agriculture equipment and machines. 1.3 Make a video on handling and management of farm inputs and agricultural resources. 1.4 Make a video on demonstration of skills in agricultural processes/practices in crop and animal production, fish farming and mechanization irrespective of disability, gender, socio-economic status and cultural background.
CLO.2 acquire content knowledge on concepts in Crop husbandry, Animal husbandry, Horticulture and Landscape Design, Agriculture Mechanization, Agribusiness and Fish Farming (*NTECT p18, 21,28; NTS 14i, p11).*	2.1 Write a report on branches and importance of agriculture in national development.
CLO.3 demonstrate knowledge and skills of professional teacher values and attitudes through building portfolio with the support of the mentor (*NTS 1f,p.19*; *NTECF p. 33)*	3.1 Build a portfolio on the professional teacher values and attitudes, observed in the learning environment during the school placement session.

7. Course content

In the course specification. This should provide an outline of the academic and / or practical content of the course. It should be clear how this content relates to the achievement of the intended learning outcomes. The name of each unit in the course should be *briefly* set out – the name should make it clear what the unit is about.

Unit	Topic	Sub-topic (If any)	Teaching and learning activities to achieve the learning outcome
1	Philosophical Foundations of Agriculture **(1 week)**	• Hunting and gathering • Domestication of crop plants, fish and animals • Agrarianism (Subsistence and commercial farming)	• Discuss hunting and gathering, domestication of crop plants/fish/animals, subsistence and commercial farming. • Make group/individual search for information on the historical development of agriculture in Ghana and do a PowerPoint presentation on results.
2	Concepts in agriculture **(1 week)**	• Meaning of agriculture • Branches of agriculture • Importance of agriculture in food production, income generation and women's' lives • Job opportunities and challenges in agricultural enterprise	Discuss the meaning, branches, importance, job opportunities and challenges in agriculture
3	Tool/equipment/machines and their uses **(3 weeks)**	Nature of relevant tool/equipment/machines and their uses. **Tools for Crop Production** Hand fork, hand trowel, cutlass, watering can knapsack sprayer, secateurs, shears, rake, plough, harrow, tractor, silo, maize sheller, combine harvester	• Discuss agricultural tools, equipment and machines and their uses. • Perform hands-on practicals through guided demonstration on the use of simple farm tools, equipment and machines in crop and animal production as well as fish farming irrespective of disability, gender, socio-economic status and cultural background.

		Tools for Animal Production Burdizzo, hoof cutter, drenching gun, dehorning, syringe and needle, feeding trough, water trough, harmer mill, bailing machine, wheel barrow, milking machine **Tools for Fish Farming** Outboard motor, fishing net, hook and line Canoe, fishing trap	
4	Agricultural Materials and their uses **(3 weeks)**	Nature of relevant agricultural materials, types, properties and their uses. **Crop husbandry** Soil, insecticides, herbicides, water, seeds, fertilizer, organic manure **Animal husbandry** Animal feed, water, dewormers • Accaricides, disinfectant, drugs, vaccines **Fishing** • Rivers, sea, ponds, dams, dugouts etc**.** **Agricultural mechanization** • Farm structures, dams, dugout, irrigation facilities	• Discuss agricultural materials, type, properties and their uses. • Perform hands-on farm practicals through guided demonstration to acquire skills in handling and management of farm inputs and agriculture resources • Build individual/group portfolio on the types, properties and uses of agricultural inputs and resources
5	Skills in Foundational manipulative processes **(4 weeks)**	Skills in foundational manipulative processes used in: **Crop production** Bed preparation, transplanting, weeding, earthening up, pruning, staking, fertilizer application, pesticides application, thinning out, harrowing, nursing **Horticultural and Landscape**	Carry out hands-on farm practicals through guided demonstration to acquire skills in agricultural processes/practices in crop and animal production, fish farming and agricultural mechanization irrespective of disability, gender, socioeconomic status and cultural background

		Design • Landscaping, interior and exterior decoration of homes, propagation of ornamental plants, establish and maintenance of trees hedges, lawns, etc. **Animal Husbandry** Feeds and feeding, castration, dehorning, debudding, debeaking, drenching, deticking **Fish Farming** Pond construction, stocking, maintenance of Pond, feeds and feeding, sex reversal in tilapia and cat fish production, harvesting **Agricultural Mechanization** • Tractor operation, ;ploughing, harrowing, seeding, drying of farm produce	

8. Course Assessment Components

In the course specification. The NTS and the NTECF require a move away from largely examination-based assessment to strategies to enable assessment of student teachers' skills, knowledge and understanding against the learning outcomes and through these the against the NTS

- There should be a maximum of 3 assessment components per 3 credit-course; to avoid over loading student and tutors/ lecturers
- The learning outcomes to be assessed by each assessment component should be identified.
- Each assessment component should explicitly reference the NTS or aspects of the NTS it will assess.
- Each assessment component should include:
  - The category or type, for example: written, coursework or practical, teaching, examination, collaborative project or presentation, poster, TLM
  - The type of assessment: of, for and /or as.
  - An indication of the size of each assessment component (e.g. duration of exams, word limit of written submissions, length of presentations; whether presentations have an individual or group etc.).
  - The weighting of each assessment component should be expressed as a % of total course mark (overall in each course: 60% continuous assessment of course work, 40% examination of course work).
- Each assessment should be manageable and relevant to supporting the student teachers' development.

The guidance on assess**ing student teachers from the NTS, the NTECF the CWG and the New Four Year B.Ed. should be used.**

Assessment Type: Assessment as Learning (Subject Portfolio)
Category of Assessment: Component 1
Student teachers assessed on the following:

- Selected items of student work (3 of them -10% each)
- Midterm Assessment-20%
- Reflective journal – 40%
- Organization of subject portfolio (how it is presented and organized)

Assesses Learning Outcomes: CLO.1, CLO.2 **and CLO.3**

Summary of Assessment Methods
Assessment Type: Assessment for Learning (Subject Project)
Category of Assessment: Component 2
Maximum Duration: 3 hours
Students teachers are assessed on:

- Introduction- a clear statement of the purpose and specific objectives of the project
- Methodology-20%
- Substantive or main section -40%
- Conclusion – 40%

Assesses Learning Outcomes: CLO.1, CLO.2 and CLO.3

Summary of Assessment Methods
Assessment Type: Assessment of Learning (Examination)
Category of Assessment: Component 3
Maximum Duration: 3 hours
Students teachers are assessed on:

- Examination 40%

Assesses Learning Outcomes: CLO.1, CLO.2 and CLO.3

9. Teaching and learning strategies

Detail in this section should show how the total learning hours will be used to achieve the intended learning outcomes, to provide a guide to the teaching and learning strategies to be used. Each teaching strategy should be selected as most appropriate to achieving the learning outcomes. This may include team teaching or additional tutors. As stated in the B.Ed. experiential learning and interactive teaching approaches are encouraged

10. Required Reading and reference list

One or two compulsory texts which must be made available to the student teachers and a SHORT list of 5 relevant references. These lists should be annotated with the key value of each text. Use APA style of writing.

11. Teaching and Learning Resources

Instructional resources required to support learning during the course e.g.: TLMs, lab and workshop equipment, videos, projectors

Course related professional development for tutors/ lecturers

This is not included the course manual but professional development needs must be identified to ensure all tutors / lecturers are prepared to teach the course identify any specific topics or issues which may be challenging for tutors / lecturers.

LESSON 1

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	Philosophical Foundations of Agriculture	Lesson Duration	180 minutes
Lesson description	This lesson is designed for the student teacher to concentrate on his/her specialization in Agriculture, interacting with relevant foundational history and philosophies in agriculture. This lesson shall be delivered by using face to face interaction between the tutor and student teachers, group work and power point presentations. Student teachers shall be assessed on portfolio and power point presentation. Issues of diversity, inclusivity and gender shall be addressed in the classroom.		
Previous student teacher knowledge, prior learning (assumed)	Student Teachers are: • Familiar with the historical development of agriculture in Ghana from pre-tertiary institutions		
Possible barriers to learning in the lesson	• Gender and inclusivity issues in group formation and presentation • Many students do not have interest in history		

Lesson Delivery – chosen to support students in achieving the outcomes	Face-to-face √	Practical Activity	Work-Based Leaning	Seminars	Independent Study	e-learning opportunities √	Practicum

Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	• Use **interactive lecture** to make brief presentation on the topic • Use **group discussion** to get student teachers to discuss the historical development of agriculture in Ghana • Use **e-learning opportunities** (power point presentation) to share findings in group discussion
• **Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description.** • **Write in full aspects of the NTS addressed**	The purpose of this lesson is to enable student teachers to know the chronological development of agriculture in Ghana.

• **Learning Outcome for the lesson, picked and developed from the course specification Learning indicators for each learning outcome**	**Learning Outcomes: By the end of the lesson, the student teacher will be able to:**	**Learning Indicators**	**Identify which cross cutting issues – core and transferable skills, equity and addressing diversity. How will these be addressed.**
	• Demonstrate knowledge and understanding of the chronological development of agriculture in Ghana	Explain the historical development of agriculture in Ghana.	• Gender through making conscious efforts to involve male and female students in all aspects of the lesson • Inclusivity through mixed gender grouping • Leadership skills through group work • ICT skills through searching for information online and use of power point • Team work skills through group work • Collaborative skills through group work

Topic Title	Sub-topics (if any):	Stage/Time	Teaching and Learning Activity to achieve learning outcomes depending on the delivery mode selected. Teacher led, collaborative group work or independent	
			Teacher Activity	**Student Activity**
Preparations for use of course manual and Pre–Learning interactions Historical Development, Tools And Materials In Agriculture	**Self-Introduction (If Tutor is new to the Class)** **Introduction to the Historical Development, Tools And Materials In Agriculture course manual** **Relevant Previous Knowledge**	**1/ 30 Minutes**	**<u>Self Introduction</u>** Through face-to-face interaction, Tutor/lecturer and student-teachers introduce themselves **<u>Introduction of Course Manual</u>** Tutor/Lecturer initiates discussion on the course manual emphasizing on the objectives, learning outcomes, course content and reference material **<u>Introduction of Lesson</u>** Tutor facilitates student teachers revision of their knowledge of the lesson from pre-tertiary. Tutor asks the following questions: 1. What did you learn or know about "hunting and gathering" from the JHS or SHS? 2. How did man start domestication of plants and animals?	**<u>Self Introduction</u>** Student-teachers do self-introduction (Tutor/Lecturers and student-teachers) **<u>Introduction of Course Manual</u>** Student teachers discuss the manual and what they expect to learn after studying the course **<u>Introduction of Lesson</u>** Students answer questions and do brief discussions. **<u>Expected Answer</u>** 1a. The old folks went to the forest to find fruits, roots and tubers for food. 1b. They also hunted for animals for food. 2. When man was doing hunting and gathering he taught it wise to send some animals to the house to rear, and also sent some seeds home to plant
		2 **50 minutes**	**<u>Discussion</u>** Tutor uses **interactive lecture** to explain hunting and gathering, domestication of crop plants, fish and animals and agrarianism (Subsistence and commercial farming) Teacher guides student teachers to reflect on their school observations and lessons learnt from school farm visits to answer questions	**<u>Discussion</u>** Student teachers listen, contribute to the discussion and write down important points Student teachers reflect on their school observations and lessons learnt from school farm visits to answer questions
		3 **50 minutes**	**<u>Group Assignment</u>** Tutor guides student teachers to form mixed ability groups and facilitate a discussion on hunting and gathering, domestication of crop plants, fish and animals and agrarianism	**<u>Preparation of Power Point</u>** Student teachers engage in discussions in groups on the subject matter, and prepare power point presentation.

			(Subsistence and commercial farming)	
		4 **50 minutes**	**<u>Power Point Presentation</u>** Tutor facilitates power point presentation by the groups, making sure that women and the disable also do presentation NB: Tutors are free to adapt the lesson to their own circumstances	**<u>Power Point Presentation</u>** They share the respective group work with the rest of the class through power point presentation.
Lesson assessments – evaluation of learning: of, for and as learning within the lesson (link to Learning Outcomes)	**Subject Portfolio** • Mixed group presentation by power point on historical development of agriculture in Ghana CLO1 NTS Page 14 (b). ***NTS 1c (***Demonstrates effective growing leadership qualities in the classroom and wider school). ***NTS 3b (****Carries out small-scale action research to improve practice).* ***NTS 3f (***Pays attention to all learners, especially girls and students with Special Educational Needs, ensuring their progress). ***NTS 3g (***Employs instructional strategies appropriate for mixed ability, multilingual and multi-age classes).			
Teaching Learning Resources	• Internet facility to search for information • Power point on laptop computer/PCs			
Required Text (core)	• Upham, A. A. (2018). *An introduction to agriculture.* New Delhi: F b &c Limited			
Additional Reading List				
CPD Needs	1. Effective use of search engines for information 2. Group formation and group dynamics 3. Power point usage and presentation			

LESSON 2

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	Concepts in agriculture					**Lesson Duration**	**180 minutes**
Lesson description	This lesson is designed for the student teacher to enable him/her explain and describe some important concepts in agriculture. They include meaning, branches, importance and job opportunities in agriculture. The course shall be delivered by using face to face interaction between the tutor and student teachers. Student teachers shall be assessed on report writing on importance of agriculture to national development. Issues of diversity, inclusivity and gender shall be addressed in the classroom.						
Previous student teacher knowledge, prior learning (assumed)	Student Teachers are: • Familiar with the concepts of agriculture from pre-tertiary institutions						
Possible barriers to learning in the lesson	• Gender and inclusivity issues in questioning techniques. Most females stay away from answering questions and making contributions in class						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity**	**Work-Based Leaning**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	• Use **interactive lecture** to make brief presentation on the topic • Use **think, pair and share** to enable students to discuss meaning, branches, importance and job opportunities in agriculture • Use **e-learning opportunities** to do internet search and report writing						
Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description. **Write in full aspects of the NTS addressed**	The purpose of this lesson is to enable student teachers to appreciate the importance of agriculture to national development, and be aware of the job opportunities in the area.						
Learning Outcome for the lesson, picked and developed from the course specification **Learning indicators for each learning outcome**	**Learning Outcomes: By the end of the lesson, the student teacher will be able to:**		**Learning Indicators**		**Identify which cross cutting issues – core and transferable skills, equity and addressing diversity. How will these be addressed.**		
	• Acquire content knowledge on meaning and branches of agriculture in Ghana • Demonstrate knowledge and understanding of the importance of agriculture in national development • Demonstrate knowledge of the job opportunities existing in agriculture domains, and social studies		• Explain the meaning of agriculture • State the branches agriculture in Ghana Explain the importance of agriculture in national development State the job opportunities in agriculture		• Gender through making conscious efforts to involve male and female students in all aspects of the lesson • ICT skills through searching for information online and use of power point • Team work skills through group work • Collaborative skills through group work		

Topic Title	Sub-topics (if any):	Stage/Time	Teaching and Learning Activity to achieve learning outcomes depending on the delivery mode selected. Teacher led, collaborative group work or independent	
			Teacher Activity	**Student Activity**
Concepts in agriculture		**1** **10 minutes**	**<u>Introduction of Lesson</u>** Tutor facilitates student teachers revision of their knowledge of the lesson from pre-tertiary. **<u>Task</u>** Tutor asks students to define or explain agriculture, animal husbandry, crop husbandry, horticulture and agriculture mechanisation	**<u>Introduction of Lesson</u>** Students answer questions and do brief discussions. **<u>Expected Answers</u>** -Animal husbandry: Practices that are used in rearing farm animals for food -Crop husbandry: Practices that are used in growing crops for food -Horticulture: the science and art of growing fruits, vegetables, flowers, or ornamental plants -Agriculture Mechanization: The use of farm machinery and tools in agriculture
		2 **30 minutes**	**<u>Discussion</u>** Tutor uses **interactive lecture** to explain meaning, branches and importance of agriculture	**<u>Discussion</u>** Student teachers listen, contribute to the discussion and write down important points
		3 **80 minutes**	**<u>Think, Pair and Share</u>** Tutor guides student teachers use **think, pair and share** to enable students to discuss meaning, branches, importance of agriculture and job opportunities in agriculture. Tutor should make sure that female Student Teachers and disabled participate actively.	**<u>Internet Search and Report Writing</u>** Student teachers engage in discussions in pairs to come out with elaborate meaning, branches, and importance and job opportunities in agriculture. Students use internet to seek for information and write a report.
		4 **60 minutes**	**<u>Oral Presentation</u>** Tutor facilitates oral presentations of students on the subject matter. Tutor should ensure that female Student Teachers and the disabled do presentation. NB: Tutors are free to adapt the lesson to their own circumstances	**<u>Oral Presentation</u>** They share the respective **think, pair and share report** with the rest of the class through oral presentation.

Lesson assessments – evaluation of learning: of, for and as learning within the lesson (link to Learning Outcomes)	**Subject Portfolio** al presentation of **think, pair and share report** *NTS 3e (Employs a variety of instructional strategies that encourage learner participation and critical thinking).*
Teaching Learning Resources	Internet facility to search for information on phone or laptop
Required Text (core)	• Upham, A. A. (2018). *An introduction to agriculture.* New Delhi :F b &c Limited
Additional Reading List	
CPD Needs	1. Effective use of search engines for information 2. Report writing and oral presentation

LESSON 3

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	Tool, equipment, machines and their uses: **Crop production**				**Lesson Duration**		**180 minutes**
Lesson description	In this lesson the student teacher is to explore the nature of relevant tools, equipment and machines in the crop sub-sector through guided demonstrations. Student teacher shall be introduced to non-sophisticated tools (preferably hand tools - cutlass, hand trowel, hand fork, shears, etc.). This course shall be delivered by using face to face interaction between the tutor and student teachers, and practical activity of handling or operating tools, equipment and machines. Student teachers shall be assessed on a video on manipulation of basic tools and handling or operating of basic agriculture equipment and machines. Issues of diversity, inclusivity and gender shall be addressed in the classroom.						
Previous student teacher knowledge, prior learning (assumed)	Student Teachers are: • Student teachers have seen crop farmers using tools, equipment and machines or they themselves have used these before						
Possible barriers to learning in the lesson	Gender, socio-economic status and cultural background and inclusivity issues in the use of tools, equipment and machines: Female and SEN student teachers, and students from rich homes may want to stay away from handling or operating agriculture tools, equipment and machines						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Leaning**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	• Use **interactive lecture** to make brief presentation on aagricultural tools, equipment and machines and their uses • **Guide student teachers to make a video** on manipulation of simple tools and handling or operation of basic agriculture equipment and machines • Use **e-learning opportunities** to make videos						
• **Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description.** • **Write in full aspects of the NTS addressed**	The purpose of this lesson is to enable student teachers to use simple crop farming tools, equipment and machines.						
• **Learning Outcome for the lesson, picked and developed from the course specification** **Learning indicators for each learning outcome**	**Learning Outcomes: By the end of the lesson, the student teacher will be able to:**			**Learning Indicators**		**Identify which cross cutting issues – core and transferable skills, equity and addressing diversity. How will these be addressed.**	
	• Demonstrate knowledge of simple crop farm tools, equipment and machines • Demonstrate knowledge of the uses of simple animal farm tools, equipment and machines • Acquire skills in handling or operating crop farming tools, equipment and machines			List basic crop farm tools, equipment and machines State the uses of basic crop farm tools, equipment and machines Explain how to handle and use basic crop farm tools, equipment and machines		• Gender through making conscious efforts to involve male and female students in all aspects of the lesson • Inclusivity through mixed gender grouping • ICT skills through searching for information online and use of power point • Diversity through forming mixed groups	

Topic Title	Sub-topics (if any):	Stage/Time	Teaching and Learning Activity to achieve learning outcomes depending on the delivery mode selected. Teacher led, collaborative group work or independent	
			Teacher Activity	**Student Activity**
Tool, equipment, machines and their uses: **Crop production**	Hand fork, hand trowel, cutlass, watering can, knapsack sprayer, secateurs, shears, rake, plough, harrow, tractor, silo, maize seller and combine harvester and others	**1** **10 minutes**	**Introduction of Lesson** Tutor facilitates student teachers revision of their knowledge of the lesson by asking them to list and describe some crop farm tools, equipment and machines. Tutor may ask the following question: **Task** List two (2) tools, equipment and machines, respectively that are used for crop farming	**Introduction of Lesson** Students answer questions and do brief discussions. **Expected Answers** -Tools: cutlass, hoe, etc. -Equipment: planter, harrow -Machine: Tractor, combine harvester
		2 **60 minutes**	**Discussion** Tutor uses **interactive lecture** to state and explain the uses of the following: Hand fork, hand trowel, cutlass, watering can, knapsack sprayer, secateurs, shears, rake, plough, harrow, tractor, silo, maize seller and combine harvester	**Discussion** Student teachers listen, contribute to the discussion and write down important points
		3 **110 minutes**	**Demonstration** Tutor takes student teachers to the school farm or nearby farm and Technicians will demonstrate the handling of these tools, equipment and machines. Tutor should ensure that female and SEN Students Teachers are involved. **Video Recording** Tutor guides student teachers to make a video of the practical session. SEN Student Teachers should be involved. NB: Tutors are free to adapt the lesson to their own circumstances	**On-hands Practicals** Student teachers practise the handling of the tools, equipment and machines. **Video Recording** Student teachers make videos of the demonstrations
Lesson assessments – evaluation of learning: of, for and as learning within the lesson (link to Learning Outcomes)	**Subject Portfolio** Practical demonstration of the handling or operation of crop farm tools, equipment and machines Video on handling or operation of animal farm tools, equipment and machines: • NTS 3e (Employs a variety of instructional strategies that encourages student participation and critical thinking).			

	NTS 3f (Pays attention to all learners, especially girls and students with Special Educational Needs, ensuring their progress).
Teaching Learning Resources	Video camera or Smart phones for recording
Required Text (core)	• Upham, A. A. (2018). *An introduction to agriculture.* New Delhi:F b &c Limited
Additional Reading List	Acquah, G. (2004). *Horticulture: principles and practice.* (*3rd ed*.). Tpper Saddle River N. T: Prentice Hall. Vyas, A. K. (2014). *An Introduction to Agriculture. (6th ed)*. New Delhi: Jain Brothers.
CPD Needs	Video shooting

LESSON 4

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	**Tool, equipment, machines and their uses: Animal production**				**Lesson Duration**	**180 minutes**	
Lesson description	In this lesson the student teacher is to explore the nature of relevant tools, equipment and machines in the animal sub-sector through guided demonstrations. Student teacher shall be introduced to non-sophisticated tools (preferably hand tools - burdizzo, hoof cutter, secateurs, etc.). This course shall be delivered by using face to face interaction between the tutor and student teachers, and practical activity of handling or operating tools, equipment and machines. Student teachers shall be assessed on a video on manipulation of basic tools and handling or operating of basic agriculture equipment and machines. Issues of diversity, inclusivity and gender shall be addressed in the classroom.						
Previous student teacher knowledge, prior learning (assumed)	Student Teachers are: • Student teachers have seen livestock farmers using tools, equipment and machines or they themselves have used these before						
Possible barriers to learning in the lesson	Gender, socio-economic status and cultural background and inclusivity issues in the use of tools, equipment and machines: Female and SEN student teachers, and students from rich homes may want to stay away from handling or operating agriculture tools, equipment and machines						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Leaning**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	• Use **interactive lecture** to make brief presentation on animal aagricultural tools, equipment and machines and their uses • **Guide student teachers to make a video** on manipulation of basic tools and handling or operation of basic agriculture equipment and machines. • Use **demonstration** to let student tutors practice how to use agriculture tools, equipment and machines • Use **e-learning** opportunities to make videos						
• **Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description.** • **Write in full aspects of the NTS addressed**	The purpose of this lesson is to enable student teachers to use simple animal farming tools, equipment and machines.						
• **Learning Outcome for the lesson, picked and developed from the course specification Learning indicators for each learning outcome**	**Learning Outcomes: By the end of the lesson, the student teacher will be able to:**			**Learning Indicators**		**Identify which cross cutting issues – core and transferable skills, equity and addressing diversity. How will these be addressed.**	
	• Demonstrate knowledge of simple animal farm tools, equipment and machines • Demonstrate knowledge of the uses of simple animal farm tools, equipment and machines			List basic animal farm tools, equipment and machines State the uses of basic animal farm tools, equipment and machines Explain how to handle and use basic animal farm tools, equipment and machines		• Gender through making conscious efforts to involve male and female students in all aspects of the lesson • Inclusivity through mixed gender grouping • ICT skills through searching for information online and use of power point • Diversity through the formation of mixed groups	

	• Acquire skills in handling or operating animal farming tools, equipment and machines domains, and social studies			
Topic Title	**Sub-topics (if any):**	**Stage/Time**	**Teaching and Learning Activity to achieve learning outcomes depending on the delivery mode selected. Teacher led, collaborative group work or independent**	
			Teacher Activity	**Student Activity**
Tool, equipment, machines and their uses: **Animal production**	Burdizzo, hoof cutter, drenching gun, dehorning machine, syringe and needle, feeding trough, water trough, harmer mill, bailing machine, wheel burrow, milking machine **and others**	**1** **10 minutes**	**<u>Introduction of Lesson</u>** Tutor facilitates student teachers revision of their knowledge of the lesson by asking them to list and describe some animal farm tools, equipment and machines	**<u>Introduction of Lesson</u>** Students answer questions and do brief discussions. -Tools: hoof cutter, burdizzo, etc. -Equipment: forage chopper, drenching gun -Machine: Tractor, forage harvester
		2 **60 minutes**	**<u>Discussion</u>** Tutor uses **interactive lecture** to state and explain the uses of the following: Burdizzo, hoof cutter, drenching gun, dehorning machine, syringe and needle, feeding trough, water trough, harmer mill, bailing machine, wheel burrow, milking machine **and others**	**<u>Discussion</u>** Student teachers listen, contribute to the discussion and write down important points
		3 **110 minutes**	**<u>Demonstration</u>** Tutor takes student teachers to the school farm or nearby farm and Technicians demonstrate the handling of these tools, equipment and machines. Tutor should ensure that female and SEN Student Teachers participate fully. **<u>Video Recording</u>** Tutor guides student teachers to make a video of the practical session. Tutor should ensure that SEN Student Teachers participate fully. NB: Tutors are free to adapt the lesson to their own circumstances	**<u>On-hands Practicals</u>** Student teachers practise the handling of the tools, equipment and machines. **<u>Video Recording</u>** Student teachers make videos of the demonstrations

Lesson assessments – evaluation of learning: of, for and as learning within the lesson (link to Learning Outcomes)	**Subject Portfolio** • Practical demonstration of the handling or operation of animal farm tools, equipment and machines • Video on handling or operation of animal farm tools, equipment and machines: NTS 3e (Employs a variety of instructional strategies that encourages student participation and critical thinking). *NTS 3f (Pays attention to all learners, especially girls and students with Special Educational Needs, ensuring their progress).*
Teaching Learning Resources	• Video camera or Smart phones for recording • Animal farm tools, equipment and machines
Required Text (core)	• Upham, A. A. (2018). *An introduction to agriculture.* New Delhi:F b &c Limited
Additional Reading List	Koney, E. B. M. (2004). *Livestock production and health*. Accra: Advent Press. Koney, E. B. M. (2004). *Poultry production and health*. Accra: Advent Press. Vyas, A. K. (2014). *An Introduction to Agriculture. (6th ed)*. New Delhi: Jain Brothers.
CPD Needs	Video shooting

LESSON 5

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 **5** 6 7 8 9 10 11 12

Title of Lesson	Tool, equipment, machines and their uses: **Fish farming**				**Lesson Duration**	**180 minutes**	
Lesson description	In this lesson the student teacher is to explore the nature of relevant tools, equipment and machines in the fish farming sub-sector through guided demonstrations. Student teacher shall be introduced to non-sophisticated tools (preferably – outboard motor, fishing net, hook and line, canoe, fishing trap, etc.). This course shall be delivered by using face to face interaction between the tutor and student teachers, and practical activity of handling or operating tools, equipment and machines. Student teachers shall be assessed on a video on manipulation of basic tools and handling or operation of basic fish farming equipment and machines. Issues of diversity, inclusivity and gender shall be addressed in the classroom.						
Previous student teacher knowledge, prior learning (assumed)	Student teachers have seen fish farmers using tools, equipment and machines physically or on the television						
Possible barriers to learning in the lesson	Gender, socio-economic status and cultural background and inclusivity issues in the use of tools, equipment and machines: Female and SEN student teachers, and students from rich homes may want to stay away from handling or operating agriculture tools, equipment and machines						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Leaning**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	• Use **interactive lecture** to make brief presentation on fish farming tools, equipment and machines and their uses • **Guide student teachers to make a video** on manipulation of basic tools and handling or operation of basic fish farming equipment and machines.						
Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description. **Write in full aspects of the NTS addressed**	The purpose of this lesson is to enable student teachers to use simple fish farming tools, equipment and machines.						
• **Learning Outcome for the lesson, picked and developed from the course specification** **Learning indicators for each learning outcome**	**Learning Outcomes: By the end of the lesson, the student teacher will be able to:**		**Learning Indicators**		**Identify which cross cutting issues – core and transferable skills, equity and addressing diversity. How will these be addressed.**		
	• Demonstrate knowledge of simple fish farm tools, equipment and machines • Demonstrate knowledge of the uses of simple fish farm tools, equipment and machines		List basic fish farm tools, equipment and machines State the uses of basic fish farm tools, equipment and machines Handle and use basic fish farm tools, equipment and machines		• Gender through making conscious efforts to involve both male and female students in all aspects of the lesson • Inclusivity through mixed gender grouping • ICT skills through searching for information online and use of power point • Diversity through formation of mixed group		

	• Acquire skills in handling or operating fish farming tools, equipment and machines domains, and social studies			
Topic Title	**Sub-topics (if any):**	**Stage/ Time**	**Teaching and Learning Activity to achieve learning outcomes depending on the delivery mode selected. Teacher led, collaborative group work or independent**	
			Teacher Activity	**Student Activity**
Tool, equipment, machines and their uses: **Fish farming**	Outboard motor, fishing net, hook and line, canoe, fishing trap **and others**	**1** **10 minutes**	**<u>Introduction of Lesson</u>** Tutor facilitates student teachers revision of their knowledge of the lesson by asking them to list and describe some fish farming tools, equipment and machines	**<u>Introduction of Lesson</u>** Students answer questions and do brief discussions. -Tools: hook and line -Equipment: fishing trap, fishing net -Machine: Outboard motor, canoe
		2 **60 minutes**	**<u>Discussion</u>** Tutor uses **interactive lecture** to state and explain the uses of the following: Outboard motor, fishing net, hook and line, canoe, fishing trap **and others.**	**<u>Discussion</u>** Student teachers listen, contribute to the discussion and write down important points
		3 **110 minutes**	**<u>Demonstration</u>** Tutor takes student teachers to the school fish farm or nearby farm and Technicians will demonstrate the handling of these tools, equipment and machines. Tutor should ensure that female and SEN Student Teachers participate fully. **<u>Video Recording</u>** Tutor guides student teachers to make a video of the practical session. Tutor should ensure that SEN Student Teachers participate fully. NB: Tutors are free to adapt the lesson to their own circumstances	**<u>On-hands Practicals</u>** Student teachers practise the handling of the tools, equipment and machines. **<u>Video Recording</u>** Student teachers make videos of the demonstrations
Lesson assessments – evaluation of learning: of, for and as learning within the lesson (link to Learning Outcomes)	**Subject Portfolio** • Video on handling or operation of fish farming tools, equipment and machines • Practical demonstration of the handling or operation of fish farming tools, equipment and machines *NTS 3e (Employs a variety of instructional strategies that encourages student participation and critical thinking).* *NTS 3f (Pays attention to all learners, especially girls and students with Special Educational Needs, ensuring their progress).*			

Teaching Learning Resources	• laptop computer/PCs/Smart phones for video recording • fish farming tools, equipment and machines
Required Text (core)	• Upham, A. A. (2018). *An introduction to agriculture.* New Delhi:F b &c Limited • Bluwey, F. A., Taiwo, I. O., Okonji, V. A., Kumah, L. A., Ipinmoroti, M. O., Boateng, M. A., & Idoko, F. A. (2018). *Introduction to Fisheries of West Africa* (Volume 1). Benin City: Root and Associates Printing and Publishing House
Additional Reading List	• MOFA (2004). *Fisheries in Ghana - A handbook on the fisheries sector in Ghana.* Accra: Ministry of Food and Agriculture • Stickney, R. R. (2005). *Aquaculture –Introductory text*. London: Cabi Publishing
CPD Needs	Video shooting

LESSON 6

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	Nature of relevant agricultural materials, types, properties and their uses: **Crop production**					**Lesson Duration**	**180 minutes**
Lesson description	This course is designed for the student teacher to explore the nature of relevant materials used in crop production. The course shall be delivered by using face to face interaction between the tutor and student teachers, and practical activity of handling crop farming materials. Student teachers shall be assessed on portfolio on types, properties and uses of materials for crop production, and hands-on farm practical demonstration of handling and management of farm inputs. Issues of diversity, inclusivity and gender shall be addressed in the classroom.						
Previous student teacher knowledge, prior learning (assumed)	Student Teachers have seen or handle soil, fertilizers, pesticides, insecticides, etc.						
Possible barriers to learning in the lesson	Risk in handling pesticides and insecticides may deter some student teachers from handling these materials						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Leaning**	**Seminars**	**Independent Study**	**e-learning opportunities**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	• Use **interactive lecture** to make brief presentation on crop farming materials, their properties and uses • **Guide student teachers to prepare** a portfolio on types, properties and uses of crop farming materials • Use **demonstration** to let student teachers perform hands-on practicals on the use of crop farm materials						
Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description. Write in full aspects of the NTS addressed	The purpose of this lesson is to enable student teachers to adequately handle and use crop farming materials safely.						
Learning Outcome for the lesson, picked and developed from the course specification **Learning indicators for each learning outcome**	**Learning Outcomes: By the end of the lesson, the student teacher will be able to:**		**Learning Indicators**		**Identify which cross cutting issues – core and transferable skills, equity and addressing diversity. How will these be addressed.**		
	• Demonstrate knowledge of types and properties of crop farming materials (inputs) • Demonstrate knowledge of the uses of crop farming materials (inputs) • Acquire skills in handling crop farming materials		Describe the properties of the three types of soils State the difference between the effective use of organic and inorganic fertilizers • State how to handle pesticides and insecticides safely • List the safety precautions used in handling pesticides		• Diversity through mixed group formation		

Topic Title	Sub-topics (if any):	Stage/Time	Teaching and Learning Activity to achieve learning outcomes depending on the delivery mode selected. Teacher led, collaborative group work or independent	
			Teacher Activity	**Student Activity**
Nature of relevant agricultural materials, types, properties and their uses: **Crop production**	Soil insecticides, herbicides, seeds, fertilizers **and others**	**1** **10 minutes**	**Introduction of Lesson** Tutor facilitates student teachers revision of their knowledge of the lesson by asking them to list and describe some crop farming materials known to them.	**Introduction of Lesson** Students answer questions and do brief discussions. Fertilizer, manure, etc.
		2 **60 minutes**	**Discussion** Tutor uses **interactive lecture** to make presentations on **types of crop farming materials, their properties and uses and others.**	**Discussion** Student teachers listen, contribute to the discussion and write down important points
		3 **60 minutes**	**Demonstration** Tutor takes student teachers to the school crop farm or nearby farm and Technicians will demonstrate the safe handling of materials. Tutor should ensure that female and SEN Student Teachers participate fully.	**On-hands Practicals** Student teachers perform hands-on farm practicals to acquire skills in handling and management of crop farming materials
		4 **50 minutes**	**Building Portfolio** Tutor guides student teachers to build individual or group portfolio on types, properties and uses of crop farming materials • NB: Tutors are free to adapt the lesson to their own circumstances	**Portfolio Building** Student teachers build portfolio of crop farm materials individually or in groups
Lesson assessments – evaluation of learning: of, for and as learning within the lesson (link to Learning Outcomes)	**Subject Portfolio** • Practical demonstration of the handling of crop farming materials • Portfolio on handling crop farming materials *TS 3e (Employs a variety of instructional strategies that encourages student participation and critical thinking).* *TS 3f (Pays attention to all learners, especially girls and students with Special Educational Needs, ensuring their progress).*			
Teaching Learning Resources	Crop farming materials e.g. fertilizers, pesticides, manure, etc.			
Required Text (core)	• Upham, A. A. (2018). *An introduction to agriculture.* New Delhi:F b &c Limited • Acquah, G. (2004). *Horticulture: principles and practice.* (*3rd ed*.). Tpper Saddle River N. T: Prentice Hall.			
Additional Reading List	• Vyas, A. K. (2014). *An Introduction to Agriculture. (6th ed)*. New Delhi: Jain Brothers.			
CPD Needs	1. Safety use of agro-chemicals 2. Skills in building a portfolio			

LESSON 7

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	Nature of relevant agricultural materials, types, properties and their uses: **Animal production**				**Lesson Duration**	**180 minutes**	
Lesson description	This lesson is designed for the student teacher to explore the nature of relevant materials used in animal production. The lesson shall be delivered by using face to face interaction between the tutor and student teachers, and practical activity of handling animal farming materials. Student teachers shall be assessed on portfolio on types, properties and uses of materials for animal production, and hands-on farm practical demonstration of handling and management of animal production inputs. Issues of diversity, inclusivity and gender shall be addressed in the classroom.						
Previous student teacher knowledge, prior learning (assumed)	• Student Teachers are familiar with feed given to poultry and ruminants. • They are also familiar with drugs and vaccines given to human beings or animals.						
Possible barriers to learning in the lesson	Drugs and vaccines are used by Veterinarians or their Technicians						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face** √	**Practical Activity** √	**Work-Based Leaning**	**Seminars**	**Independent Study**	**e-learning opportunities**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	• Use **interactive lecture** to make brief presentation on animal farming materials, their properties and uses • **Guide student teachers to prepare** a portfolio on types, properties and uses of animal farming materials • Use **demonstration** to let student tutors do hands-on practicals on handling and management of animal feeding materials						
Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description. **Write in full aspects of the NTS addressed**	The purpose of this lesson is to enable student teachers to adequately handle and use animal farming materials safely.						
Learning Outcome for the lesson, picked and developed from the course specification **Learning indicators for each learning outcome**	**Learning Outcomes: By the end of the lesson, the student teacher will be able to:**		**Learning Indicators**		**Identify which cross cutting issues – core and transferable skills, equity and addressing diversity. How will these be addressed.**		
	• Demonstrate knowledge and understanding of types and properties of basic animal farming materials (inputs) • Demonstrate knowledge of the uses of animal farming materials (inputs) • Acquire skills in handling animal farming materials		Describe the properties of compounded feed, grasses and legumes • State the uses of various basic animal farming materials • Explain how to handle animal feed, drugs and vaccines safely • List the safety precautions used in handling drugs and vaccines		• Diversity through ensuring equal participation on hands-on practicals		

Topic Title	Sub-topics (if any):	Stage/Time	Teaching and Learning Activity to achieve learning outcomes depending on the delivery mode selected. Teacher led, collaborative group work or independent	
			Teacher Activity	**Student Activity**
Nature of relevant agricultural materials, types, properties and their uses: **Crop production**	Animal feed, water, dewormers, accaricides, disinfectant, drugs, vaccines **and others**	**1** **10 minutes**	**Introduction of Lesson** Tutor facilitates student teachers revision of their knowledge of the lesson by asking them to list and describe some animal farming materials known to them.	**Introduction of Lesson** Students answer questions and do brief discussions. Feed, drugs, etc.
		2 **60 minutes**	**Discussion** Tutor uses **interactive lecture** to make presentations on **types** of animal farming materials, their properties and uses **and others.**	**Discussion** Student teachers listen, contribute to the discussion and write down important points
		3 **60 minutes**	**Demonstration** Tutor takes student teachers to the school animal farm or nearby farm and Technicians will demonstrate the safe handling of materials. Tutor should ensure that female and SEN Student Teachers participate fully.	**On-hands Practicals** Student teachers perform hands-on farm practicals to acquire skills in handling and management of animal farming materials
		4 **50 minutes**	**Building Portfolio** Tutor guides student teachers to build individual or group portfolio on types, properties and uses of animal farming materials • NB: Tutors are free to adapt the lesson to their own circumstances	**Building Portfolio** Student teachers build portfolio of animal farm materials individually or in groups
Lesson assessments – evaluation of learning: of, for and as learning within the lesson (link to Learning Outcomes)	**Subject Portfolio** • Practical demonstration of the handling of animal farming materials • Portfolio on handling animal farming materials *TS 3e (Employs a variety of instructional strategies that encourages student participation and critical thinking).* *TS 3f (Pays attention to all learners, especially girls and students with Special Educational Needs, ensuring their progress).*			
Teaching Learning Resources	Animal production materials e.g. feed, drugs, water etc.			
Required Text (core)	• Upham, A. A. (2018). *An introduction to agriculture.* New Delhi:F b &c Limited • Acquah, G. (2004). *Horticulture: principles and practice.* (*3rd ed*.). Tpper Saddle River N. T: Prentice Hall.			
Additional Reading List	• Vyas, A. K. (2014). *An Introduction to Agriculture. (6th ed)*. New Delhi: Jain Brothers. • Koney, E. B. M. (2004). *Livestock production and health*. Accra: Advent Press. • Koney, E. B. M. (2004). *Poultry production and health*. Accra: Advent Press.			
CPD Needs	1. Safety use of animal feed, drugs and vaccines 2. Skills in building a portfolio			

LESSON 8

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	Nature of relevant agricultural materials, types, properties and their uses: **Fish Farming and Agriculture Mechanization**					**Lesson Duration**	**180 minutes**
Lesson description	This lesson is designed for the student teacher to explore the nature of relevant materials used in fish farming and agriculture mechanization. The lesson shall be delivered by using face to face interaction between the tutor and student teachers, and practical activity of handling fish farming materials (dams, dugouts, rivers, feed, drugs, etc. and agriculture mechanization materials (dams, dugouts, irrigation facilities, etc). Student teachers shall be assessed on portfolio on types, properties and uses of materials for fish farming and agriculture mechanization, and hands-on farm practical demonstration of handling and management of inputs. Issues of diversity, inclusivity and gender shall be addressed in the classroom.						
Previous student teacher knowledge, prior learning (assumed)	• Student Teachers are familiar with medium used in raising fish. • They are also familiar with feed given to fish. • Most of the materials in agriculture mechanization are used in fish farming						
Possible barriers to learning in the lesson	• Fish farming is popular in coastal areas but not in the forest areas. Student teachers from forest areas may therefore not be interested in fish farming • The practise of agriculture mechanization in Ghana is very limited. Student teachers may therefore not be interested in agriculture mechanization because of the limited job opportunities						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face** √	**Practical Activity** √	**Work-Based Leaning**	**Seminars**	**Independent Study**	**e-learning opportunities**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	• Use **interactive lecture** to make brief presentation on fish farming and agriculture mechanization materials, their properties and uses • **Guide student teachers to prepare** a portfolio on types, properties and uses of fish farming and agriculture mechanization materials.						
• **Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description.** • **Write in full aspects of the NTS addressed**	The purpose of this lesson is to enable student teachers to adequately handle and use fish farming and agriculture mechanization materials safely.						
• **Learning Outcome for the lesson, picked and developed from the course specification** **Learning indicators for each learning outcome**	**Learning Outcomes: By the end of the lesson, the student teacher will be able to:**		**Learning Indicators**			**Identify which cross cutting issues – core and transferable skills, equity and addressing diversity. How will these be addressed.**	
	• Demonstrate knowledge and understanding of types and properties of basic fish farming and agriculture mechanization materials (inputs)		Describe the properties of fish farming and agriculture mechanization materials State the uses of various basic fish farming and agriculture mechanization materials • Explain how to handle fish feed, drugs and vaccines			• Diversity through ensuring equal participation in hands-on practicals	

	• Demonstrate knowledge of the uses of fish farming and agriculture mechanization materials (inputs) • Acquire skills in handling fish farming and agriculture mechanization materials domains, and social studies		safely • List the safety precautions used in handling fish farming drugs and vaccines	
Topic Title	**Sub-topics (if any):**	**Stage/Time**	**Teaching and Learning Activity to achieve learning outcomes depending on the delivery mode selected. Teacher led, collaborative group work or independent**	
			Teacher Activity	**Student Activity**
Nature of relevant agricultural materials, types, properties and their uses: **Fish Farming and Agriculture Mechanization**	Rivers, seas, dams, dugouts, ponds, irrigation facilities, **and others**	**1** **10 minutes**	**Introduction of Lesson** Tutor facilitates student teachers revision of their knowledge of the lesson by asking them to list and describe some fish farming agriculture mechanization materials known to them	**Introduction of Lesson** Students answer questions and do brief discussions. - Fish farming: feed, water -Mechanization: fuel, engine oil
		2 **60 minutes**	**Discussion** Tutor uses **interactive lecture** to make presentations on **types** of fish farming and agriculture mechanization materials, their properties and uses **and others.** **Teacher guides students teachers to reflect on their school observations and lessons learnt from the school farm visits to answer questions**	**Discussion** Student teachers listen, contribute to the discussion and write down important points **Students teachers to reflect on their school observations and lessons learnt from the school farm visits to answer questions**
		3 **60 minutes**	**Demonstration** Tutor takes student teachers to the school fish farm or nearby farm and Technicians will demonstrate the safe handling of materials. Tutor should ensure that female and SEN Student Teachers participate fully.	**On-hands Practicals** Student teachers perform hands-on farm practicals to acquire skills in handling and management of fish farming materials
		4 **50 minutes**	**Building Portfolio** Tutor guides student teachers to build individual or group portfolio on types, properties and uses of fish farming materials • NB: Tutors are free to adapt the lesson to their	**Building Portfolio** tudent teachers build portfolio of fish farm materials individually or in groups

			own circumstances	
Lesson assessments – evaluation of learning: of, for and as learning within the lesson (link to Learning Outcomes)	**Subject Portfolio** • Practical demonstration of the handling of fish farming and agriculture mechanization materials • Portfolio on handling fish farming and agriculture mechanization materials *NTS 3e (Employs a variety of instructional strategies that encourages student participation and critical thinking).* *NTS 3f (Pays attention to all learners, especially girls and students with Special Educational Needs, ensuring their progress).*			
Teaching Learning Resources	**Fish Farming and Agriculture Mechanization**			
Required Text (core)	• Bluwey, F. A., Taiwo, I. O., Okonji, V. A., Kumah, L. A., Ipinmoroti, M. O., Boateng, M. A., & Idoko, F. A. (2018). *Introduction to Fisheries of West Africa* (Volume 1). Benin City: Root and Associates Printing and Publishing House • Upham, A. A. (2018). *An introduction to Agriculture.* New Delhi: Fb &c Limited			
Additional Reading List	• MOFA (2004). *Fisheries in Ghana - A handbook on the fisheries sector in Ghana.* Accra: Ministry of Food and Agriculture • Stickney, R. R. (2005). *Aquaculture –Introductory text*. London: Cabi Publishing.			
CPD Needs	1. Safety use of fish feed, drugs and vaccines 2. Skills in building a portfolio			

LESSON 9

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 **9** 10 11 12

Title of Lesson	Skills in Foundational manipulative processes: **Crop production, horticulture and landscape design**				**Lesson Duration**	**180 minutes**	
Lesson description	This lesson is designed for the student teacher to explore the nature of relevant foundational manipulative processes/practices (nursing, pricking out, stumping, weeding, drying, etc.) either in whole or in part using non-sophisticated tools and materials. The lesson shall be delivered by using face to face interaction between the tutor and student teachers, and hands-on farm practicals through guided demonstration to acquire skills in crop production, horticulture and landscape design processes/practices, irrespective of disability, gender, socio-economic status and cultural background. Student teachers shall be assessed on video of demonstration on crop farming, horticulture and landscape design processes/ practices, and hands-on farm practical demonstration of skills in manipulation of crop production, horticulture and landscape design processes/practices.						
Previous student teacher knowledge, prior learning (assumed)	Student Teachers are familiar with some crop production, horticulture and landscape design practices.						
Possible barriers to learning in the lesson	Gender, socio-economic status and cultural background and inclusivity issues in crop farming: Female and SEN student teachers, and students from rich homes may want to stay away from crop farming practices						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Leaning**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	• Use **interactive lecture** to make brief presentation on skills acquisition in crop production, horticulture and landscape design practices • **Guide student teachers to prepare a video** on demonstration of skills in crop farming, horticulture and landscape design processes/ practices • **Use e-learning opportunities** to make videos						
• **Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description.** • **Write in full aspects of the NTS addressed**	The purpose of this lesson is to enable student teachers to acquire manipulative skills in crop production, horticulture and landscape design processes/practices, irrespective of disability, gender, socio-economic status and cultural background.						
• **Learning Outcome for the lesson, picked and developed from the course specification Learning indicators for each learning outcome**	**Learning Outcomes: By the end of the lesson, the student teacher will be able to:**		**Learning Indicators**		**Identify which cross cutting issues – core and transferable skills, equity and addressing diversity. How will these be addressed.**		
	• Demonstrate knowledge and understanding of types of skills involved in crop production, horticulture and landscape design practices • Acquire skills in manipulative processes/practices in crop production, horticulture and landscape design domains		Explain the skills involved in crop production, horticulture and landscape design practices Apply crop production, horticulture and landscape design practices in the field		• Diversity through formation of mixed group • Gender, • ICT skills through searching for information online and use of power point • Team work through formation of groups • Leadership through group work		

Topic Title	Sub-topics (if any):	Stage/Time	Teaching and Learning Activity to achieve learning outcomes depending on the delivery mode selected. Teacher led, collaborative group work or independent	
			Teacher Activity	**Student Activity**
Skills in Foundational manipulative processes: **Crop production, horticulture and landscape design**	Bed preparation, transplanting, weeding, earthening up, pruning, staking, fertilizer application, pesticides application, thinning out, harrowing, nursing, landscaping, interior and exterior decoration of homes, propagation of ornamental plants, establish and maintenance of trees hedges, lawns, **and others**	**1** **10 minutes**	**Introduction of Lesson** Tutor facilitates student teachers revision of their knowledge of the lesson by asking them to describe how maize or some other crop is cultivated from sowing to harvesting	**Introduction of Lesson** Students answer questions and do brief discussions
		2 **40 minutes**	**Discussion** Tutor uses **interactive lecture** to make presentations on skills acquisition in **crop farming, horticulture and landscape design practices.** **Teacher guides students teachers to reflect on their school observations and lessons learnt from the school farm visits to answer questions**	**Discussion** Student teachers listen, contribute to the discussion and write down important points **Students teachers to reflect on their school observations and lessons learnt from the school farm visits to answer questions**
		3 **80 minutes**	**Demonstration** Tutor takes student teachers to the school crop farm and school campus and Technicians will demonstrate some of the practices. Tutor should ensure that female and SEN Student Teachers participate fully.	**Hands-on Practicals** Student teachers perform hands-on farm practicals to acquire skills in crop production, horticulture and landscape design practices
		4 **50 minutes**	**Video Recording** Tutor guides student teachers to make video on skills in crop production, horticulture and landscape design practices. Tutor should ensure that SEN Student Teachers participate fully.	**Video Recording** In groups, student teachers make video of skills in crop production, horticulture and landscape design practices

			• NB: Tutors are free to adapt the lesson to their own circumstances	
Lesson assessments – evaluation of learning: of, for and as learning within the lesson (link to Learning Outcomes)	**Subject Portfolio** • Practical demonstration of manipulative skills in crop production, horticulture and landscape design practices • Video on skills in crop production, horticulture and landscape design practices *TS 3e (Employs a variety of instructional strategies that encourages student participation and critical thinking).* *TS 3f (Pays attention to all learners, especially girls and students with Special Educational Needs, ensuring their progress).*			
Teaching Learning Resources	Computers (Laptops or PCs) and internet facilities, Video camera, farm tools (hand fork, hand trowel, cutlass, watering can, knapsack sprayer, secateurs, shears, rake, etc,), fertilizer, Smart phones, etc.			
Required Text (core)	• Upham, A. A. (2018). *An introduction to agriculture.* New Delhi:F b &c Limited • Acquah, G. (2004). *Horticulture: principles and practice.* (*3rd ed*.). Tpper Saddle River N. T: Prentice Hall.			
Additional Reading List	• Vyas, A. K. (2014). *An Introduction to Agriculture. (6th ed)*. New Delhi: Jain Brothers.			
CPD Needs	Video shooting			

LESSON 1

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	Skills in Foundational manipulative processes: **Animal production**				**Lesson Duration**	**180 minutes**	
Lesson description	This lesson is designed for the student teacher to explore the nature of relevant foundational manipulative processes/practices (feeding preparation, feeding, deworming, deticking, branding, castration, debudding, debeaking, dehorning, etc.) either in whole or in part using non-sophisticated tools and materials. The lesson shall be delivered by using face to face interaction between the tutor and student teachers, and hands-on farm practicals through guided demonstration to acquire skills in animal production processes/practices, irrespective of disability, gender, socio-economic status and cultural background. Student teachers shall be assessed on video of demonstration on animal farming processes/ practices, and hands-on farm practical demonstration of skills in manipulation of animal production processes/practices.						
Previous student teacher knowledge, prior learning (assumed)	Student Teachers are familiar with some animal production practices.						
Possible barriers to learning in the lesson	Many students fear handling of animals: Female and SEN student teachers, and students from rich homes may want to stay away from animal handling						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Leaning**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	• Use **interactive lecture** to make brief presentation on skills acquisition in animal production practices • **Use e-learning opportunities to** prepare a video on demonstration of skills in animal farming processes/ practices						
• **Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description.** • **Write in full aspects of the NTS addressed**	The purpose of this lesson is to enable student teachers to acquire manipulative skills in animal production processes/practices, irrespective of disability, gender, socio-economic status and cultural background.						
• **Learning Outcome for the lesson, picked and developed from the course specification Learning indicators for each learning outcome**	**Learning Outcomes: By the end of the lesson, the student teacher will be able to:**		**Learning Indicators**		**Identify which cross cutting issues – core and transferable skills, equity and addressing diversity. How will these be addressed.**		
	• Demonstrate knowledge and understanding of types of skills involved in animal production practices • Acquire skills in manipulative processes/practices in animal production domains, and social studies		Explain the skills involved in animal production practices Apply skills in animal production practices in the field		• Gender, • ICT skills through searching for information online and use of power point • Diversity through the formation of mixed groups • Leadership through group work • Team work through group formation		

Topic Title	Sub-topics (if any):	Stage/Time	Teaching and Learning Activity to achieve learning outcomes depending on the delivery mode selected. Teacher led, collaborative group work or independent	
			Teacher Activity	**Student Activity**
Skills in Foundational manipulative processes: **Animal production**	feeding preparation, feeding, deworming, deticking, branding, castration, debudding, debeaking, dehorning, **and others**	**1** **10 minutes**	**Introduction of Lesson** Tutor facilitates student teachers revision of their knowledge of the lesson by asking them to describe how animals are raised from birth to slaughter	**Introduction of Lesson** Students answer questions and do brief discussions
		2 **40 minutes**	**Discussion** Tutor uses **interactive lecture** to make presentations on skills acquisition in **animal farming practices.** **Teacher guides students teachers to reflect on their school observations and lessons learnt from the school farm visits to answer questions**	**Discussion** Student teachers listen, contribute to the discussion and write down important points **Students teachers to reflect on their school observations and lessons learnt from the school farm visits to answer questions**
		3 **80 minutes**	**Demonstration** Tutor takes student teachers to the school animal farm or nearby farm and Technicians will demonstrate some of the practices. Tutor should ensure that female and SEN Student Teachers participate fully.	**Hands-on Practicals** Student teachers perform hands-on farm practicals to acquire skills in animal production
		4 **50 minutes**	**Video Recording** Tutor guides student teachers to make video on skills in animal production practices. Tutor should ensure that SEN Student Teachers participate fully. • NB: Tutors are free to adapt the lesson to their own circumstances	**Video Recording** In groups, student teachers make video of skills acquisition in animal production practices
Lesson assessments – evaluation of learning: of, for and as learning within the lesson (link to Learning Outcomes)	**Subject Portfolio** • Practical demonstration of manipulative skills in animal production practices • Video on skills in animal production practices *NTS 3e (Employs a variety of instructional strategies that encourages student participation and critical thinking).* *NTS 3f (Pays attention to all learners, especially girls and students with Special Educational Needs, ensuring their progress).* **Weighting:** 300%			
Teaching Learning Resources	Computers (Laptops or PCs) and internet facilities, Video camera, animals, farm tools (maize, fish meal, soybean meal, vitamin-mineral premix, dicalcium phosphate, common salt), fertilizer, Smart phones, etc.			
Required Text (core)	• Upham, A. A. (2018). *An introduction to agriculture.* New Delhi:F b &c Limited			
Additional Reading List	Koney, E. B. M. (2004). *Livestock production and health*. Accra: Advent Press. Koney, E. B. M. (2004). *Poultry production and health*. Accra: Advent Press. Vyas, A. K. (2014). *An Introduction to Agriculture. (6th ed)*. New Delhi: Jain Brothers.			

CPD Needs	Video shooting

LESSON 1

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	Skills in Foundational manipulative processes: **Fish Farming**					**Lesson Duration**	**180 minutes**
Lesson description	This lesson is designed for the student teacher to explore the nature of relevant foundational manipulative processes/practices (Pond construction, stocking, maintenance of pond, feed formulation, sex reversal in tilapia and cat fish production, harvesting, etc.) either in whole or in part using non-sophisticated tools and materials. The lesson shall be delivered by using face to face interaction between the tutor and student teachers, and hands-on farm practicals through guided demonstration to acquire skills in fish farming processes/practices, irrespective of disability, gender, socio-economic status and cultural background. Student teachers shall be assessed on video of demonstration on fish farming processes/ practices, and hands-on farm practical demonstration of skills in manipulation of fish farming processes/practices.						
Previous student teacher knowledge, prior learning (assumed)	Student Teachers are familiar with some fish farming practices.						
Possible barriers to learning in the lesson	Student teachers in forest areas may not be interested in fish farming						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Leaning**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	• Use **interactive lecture** to make brief presentation on skills acquisition in fish farming practices • **Use e-learning to prepare a video** on demonstration of skills in fish farming processes/ practices						
Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description. **Write in full aspects of the NTS addressed**	The purpose of this lesson is to enable student teachers to acquire manipulative skills in fish farming processes/practices, irrespective of disability, gender, socio-economic status and cultural background.						
Learning Outcome for the lesson, picked and developed from the course specification **Learning indicators for each learning outcome**	**Learning Outcomes: By the end of the lesson, the student teacher will be able to:**		**Learning Indicators**		**Identify which cross cutting issues – core and transferable skills, equity and addressing diversity. How will these be addressed.**		
	• Demonstrate knowledge and understanding of types of skills involved in fish farming practices • Acquire skills in manipulative processes/practices in fish farming		Explain the skills involved in fish farming practices Apply skills in fish farming practices in the field		• Diversity through formation of mixed groups • Gender • ICT through searching for information online and preparing a videos • Leadership through group work • Team work through group formation		

Topic Title	Sub-topics (if any):	Stage/Time	Teaching and Learning Activity to achieve learning outcomes depending on the delivery mode selected. Teacher led, collaborative group work or independent	
			Teacher Activity	**Student Activity**
Skills in Foundational manipulative processes: **Animal production**	Pond construction, stocking, maintenance of pond, feed formulation, sex reversal in tilapia and cat fish production, harvesting **and others**	**1** **10 minutes**	**Introduction of Lesson** Tutor facilitates student teachers revision of their knowledge of the lesson by asking them to describe how fish are raised from hatching to harvesting	**Introduction of Lesson** Students answer questions and do brief discussions
		2 **40 minutes**	**Discussion** Tutor uses **interactive lecture** to make presentations on skills acquisition in **fish farming practices.** **Teacher guides students teachers to reflect on their school observations and lessons learnt from the school farm visits to answer questions**	**Discussion** Student teachers listen, contribute to the discussion and write down important points **Students teachers to reflect on their school observations and lessons learnt from the school farm visits to answer questions**
		3 **80 minutes**	**Demonstration** Tutor takes student teachers to the school fish farm or nearby farm and Technicians will demonstrate some of the practices. Tutor should ensure that female and SEN Student Teachers participate fully.	**On-hands Practicals** Student teachers perform hands-on farm practicals to acquire skills in fish farming
		4 **50 minutes**	**Video Recording** Tutor guides student teachers to make video on skills in fish farming practices. Tutor should ensure that SEN Student Teachers participate fully. • NB: Tutors are free to adapt the lesson to their own circumstances	**Video Recording** In groups, student teachers make video of skills acquisition in fish farming practices
Lesson assessments – evaluation of learning: of, for and as learning within the lesson (link to Learning Outcomes)	**Subject Portfolio** • Practical demonstration of manipulative skills in fish practices • Video on skills in fish farming practices *NTS 3e (Employs a variety of instructional strategies that encourages student participation and critical thinking).* *NTS 3f (Pays attention to all learners, especially girls and students with Special Educational Needs, ensuring their progress).*			
Teaching Learning Resources	Computers (Laptops or PCs) and internet facilities, Video camera, fish fingerlings, trap net, fish feed (maize, fish meal, soybean meal, vitamin-mineral premix, dicalcium phosphate, common salt), Smart phones, etc.			

Required Text (core)	• Upham, A. A. (2018). *An introduction to agriculture.* New Delhi:F b &c Limited • Bluwey, F. A., Taiwo, I. O., Okonji, V. A., Kumah, L. A., Ipinmoroti, M. O., Boateng, M. A., & Idoko, F. A. (2018). *Introduction to Fisheries of West Africa* (Volume 1). Benin City: Root and Associates Printing and Publishing House
Additional Reading List	• MOFA (2004). *Fisheries in Ghana - A handbook on the fisheries sector in Ghana.* Accra: Ministry of Food and Agriculture • Stickney, R. R. (2005). *Aquaculture –Introductory text*. London: Cabi Publishing.
CPD Needs	Video shooting

LESSON 12

Year of B.Ed.	2	Semester	1	Place of lesson in semester	1 2 3 4 5 6 7 8 9 10 11 12

Title of Lesson	Skills in Foundational manipulative processes: **Agricultural Mechanization**				**Lesson Duration**	**180 minutes**	
Lesson description	This lesson is designed for the student teacher to explore the nature of relevant foundational manipulative processes/practices (Tractor operation, ploughing, harrowing, seeding, drying of farm produce, harvesting, etc.) in Agricultural Mechanization. The lesson shall be delivered by using face to face interaction between the tutor and student teachers, and hands-on farm practicals through guided demonstration to acquire skills in agricultural mechanization processes/practices, irrespective of disability, gender, socio-economic status and cultural background. Student teachers shall be assessed on video of demonstration on agricultural mechanization processes/ practices, and hands-on farm practical demonstration of skills in manipulation of agricultural mechanization processes/practices.						
Previous student teacher knowledge, prior learning (assumed)	Student Teachers are familiar with some agricultural mechanization practices, e.g. tractor operation.						
Possible barriers to learning in the lesson	Female student and SEN teachers may not be interested in tractor operation and other practices						
Lesson Delivery – chosen to support students in achieving the outcomes	**Face-to-face √**	**Practical Activity √**	**Work-Based Leaning**	**Seminars**	**Independent Study**	**e-learning opportunities √**	**Practicum**
Lesson Delivery – main mode of delivery chosen to support student teachers in achieving the learning outcomes.	• Use **interactive lecture** to make brief presentation on skills acquisition in agricultural mechanization practices • **Use e-learning opportunities** to prepare a video on demonstration of skills in agricultural mechanization processes/ practices						
Purpose for the lesson, what you want the students to achieve, serves as basis for the learning outcomes. An expanded version of the description. **Write in full aspects of the NTS addressed**	The purpose of this lesson is to enable student teachers to acquire manipulative skills in agricultural mechanization processes/practices, irrespective of disability, gender, socio-economic status and cultural background.						
Learning Outcome for the lesson, picked and developed from the course specification **Learning indicators for each learning outcome**	**Learning Outcomes: By the end of the lesson, the student teacher will be able to:**		**Learning Indicators**		**Identify which cross cutting issues – core and transferable skills, equity and addressing diversity. How will these be addressed.**		
	• Demonstrate knowledge and understanding of types of skills involved in agricultural mechanization practices • Acquire skills in manipulative processes/practices in agricultural mechanization		Explain the skills involved in agricultural mechanization practices.1 Apply skills in agricultural mechanization practices in the field		• Diversity through formation of mixed groups • Gender • ICT through searching for information and making of videos • Leadership through group work • Team work through group formation		

Topic Title	Sub-topics (if any):	Stage/Time	Teaching and Learning Activity to achieve learning outcomes depending on the delivery mode selected. Teacher led, collaborative group work or independent	
			Teacher Activity	**Student Activity**
Skills in Foundational manipulative processes: **Animal production**	Tractor operation, ploughing, harrowing, seeding, drying of farm produce, harvesting **and others**	**1** **10 minutes**	**Introduction of Lesson** Tutor facilitates student teachers revision of their knowledge of the lesson by asking them to describe some tasks performed by tractors in the farm or other places	**Introduction of Lesson** Students answer questions and do brief discussions. Ploughing, harrowing, harvesting, etc.
		2 **40 minutes**	**Discussion** Tutor uses **interactive lecture** to make presentations on skills acquisition in agricultural mechanization **practices.** **Teacher guides students to teachers to reflect on their school observations and lessons learnt from the school farm visits to answer questions**	**Discussion** Student teachers listen, contribute to the discussion and write down important points **Students teachers to reflect on their school observations and lessons learnt from the school farm visits to answer questions**
		3 **80 minutes**	**Demonstration** Tutor takes student teachers to the school farm or nearby farm and Technicians will demonstrate some of the practices	**On-hands Practicals** Student teachers perform hands-on farm practicals to acquire skills in agriculture mechanization
		4 **50 minutes**	**Video Recording** Tutor guides student teachers to make video on skills in agricultural mechanization practices • NB: Tutors are free to adapt the lesson to their own circumstances	**Video Recording** In groups, student teachers make video of skills acquisition in agricultural mechanization
Lesson assessments – evaluation of learning: of, for and as learning within the lesson (link to Learning Outcomes)	**Subject Portfolio** • Practical demonstration of manipulative skills in agricultural mechanization • Video on skills in agricultural mechanization practices *NTS 3e (Employs a variety of instructional strategies that encourages student participation and critical thinking).* *NTS 3f (Pays attention to all learners, especially girls and students with Special Educational Needs, ensuring their progress).*			
Teaching Learning Resources	Computers (Laptops or PCs) and internet facilities, Video camera, fish fingerlings, trap net, fish feed (maize, fish meal, soybean meal, vitamin-mineral premix, dicalcium phosphate, common salt), Smart phones, etc.			
Required Text (core)	• Upham, A. A. (2018). *An introduction to agriculture.* New Delhi:F b &c Limited			
Additional Reading List	• Vyas, A. K. (2014). *An Introduction to Agriculture. (6th ed)*. New Delhi: Jain Brothers.			
CPD Needs	Team work (CPD, Theme 4); (ICT skills (CPD, Theme 5)			

Course Assessment	[1]**Component 1: Subject Portfolio Assessment (30% overall score)** • Selected items of student work (3 of them -10% each) • Midterm Assessment-20% • Reflective journal – 40% • Organization of subject portfolio (how it is presented and organized) -10% [2]**Component 2: Subject Project** • Introduction- a clear statement of the purpose and specific objectives of the project • Methodology-20% • Substantive or main section -40% • Conclusion – 40% Component 3: End of Semester Examination -40%

[1] See rubrics on subject portfolio assessment in annex 6 of NTEAP

[2] See rubrics on subject project assessment in annex 6 of NTEAP