



**Name of the organisation: Ho Technical University (HTU)**

**Address: Volta Region Ghana**

**Website: [www.htu.edu.gh](http://www.htu.edu.gh)**

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**Description of the University:**

The origin of Ho Technical University (HTU) goes back to 1968. It was established as a Technical Institute with the primary objective of providing pre-technical education. By 1972, the Institute had made tremendous progress in upgrading of the courses offered. Consequently, the pre-technical programmes expanded to courses in the Engineering and Vocational fields, e.g., Basic Engineering, Agricultural and Mechanical Engineering, Building Technology, Fashion, Hospitality Management and Business Education. In 1986, the Institute became a Polytechnic. It however continued to operate as second cycle institution, until 1993 when the Polytechnic was upgraded to a fully-fledged tertiary institution by the enactment of PNDC Law 321 and charged with the responsibility of training students in the technical and vocational skills to the Higher National Diploma [HND] level. Subsequently, in 2007, Polytechnics were given the mandate by the Polytechnics Act 745 to award their own degrees to the highest level.

The passage of the Technical Universities Act 2016 (Act 922) provided Ho Technical University and mandated it to award degrees, diplomas, certificates, and other qualifications to the highest level in Engineering, Science and Technology based disciplines, Technical and Vocational Education and Training, Applied Arts, and related disciplines.

**Collaborative Projects with McGill University:**

Bringing into line HTU's vision and mission of training and producing competent human capital into the labour market in Ghana and the international markets, the goal is to establish an equitable, reciprocal, and bi-directional partnership with McGill University through the Mastercard Foundation Transitions Project (MCF-TP). Such partnership entails the pursue of research projects and learning opportunities relevant to the needs of HTU, McGill, and their constituents.

To this end, HTU intends to initiate a number of projects in partnership with McGill MCF-TP, whose key objective is to spearhead impactful development of Africa's young demographics. The overall goal for the McGill MCF-TP is to facilitate Scholars' transition into the workforce for impact across Africa, building on McGill's MCF Scholars Program. Such impact can come through experience with community development, social entrepreneurship or policymaking efforts in Africa or other parts of the world, including Canada, where MCF Scholars and recent graduates may currently live. To learn more about the MCF-TP, visit <https://www.mcgill.ca/mastercardfdn-scholars/transitions-project>

**Poste 1: The Baobab Project - Department of Agro Enterprise Development**

**Project Description:**

Baobab (*Adansonia digitata*) has been recognized as a super food with increasing demand across the globe. However, the plant remains in the wild and without its domestication, the utilization cannot be sustained. Efforts are far advanced at Ho Technical University to domesticate Baobab. However, more work needs to be done in order to achieve the desired results.

**Supervisor/Contact Name: Dr Kenneth Fafa Egbadzor**

**Project Assistant Intern I, Entrepreneurship and Employment Creation Project**

<b>Role Description</b>	<b>Internship tasks</b>	<b>Expected Deliverables</b>
The Baobab Project at HTU is in its latest stage of research and will be set for commercialization. The Project team is looking for a Project Assistant intern who will be responsible to handle the listed internship tasks, provide support, and facilitate coordination of the research findings and its usage in the commercialization and farmers search stage	<b>Task 1:</b> Research and understand information material regarding HTU, department of Agro Enterprise Development and the Baobab project  <b>Task 2:</b> Identify farmers who are willing to invest in commercial cultivation of baobab  <b>Task 3:</b> Assist in the screening of baobab for zinc, iron and vitamin C content of leaves, pulp, kernel, and the root.  <b>Task 4:</b> Facilitate the cloning of baobab for zinc, iron, and vitamin C accessions of baobab  <b>Task 5:</b> Arrange for the supply of cloned baobab to selected farmers for planting.	<b>Deliverable 1:</b> A presentation about HTU, mandate of department of Agro Enterprise Development and a summary of the Baobab project  <b>Deliverable 2:</b> A summary document detailing farmers profiles and contact information  <b>Deliverable 3:</b> Superior baobab clones would be developed for cultivation and commercialization.  <b>Deliverable 4:</b> Superior clones of baobab identified.  <b>Deliverable 5:</b> A record of selected farmers and the number of cloned baobabs given to each farmer.

**Poste 2: Polyphenols Research Project- Department of Food Science and Technology**

**Project Description:**

In this project, polyphenols from *T. tetraphylla* are being considered for extraction optimization and biological activity assessment. Polyphenols are ubiquitous, secondary metabolites produced in plants and are found in plant-based foods such as fruits, vegetables, legumes, cereals, and pseudo-cereals, among others. Either found in diets or in other forms such as agri-food byproducts, their exploitation and use is vast, cutting across many sectors such as the food, cosmetic, pharmaceutical, nutraceutical and textile industries. Polyphenols have been linked to many health benefits, including their role in the prevention and management of obesity, cancer, cardiovascular disease (Sanches-Silva et al., 2020) among others.

To innovatively develop a natural food preservative with commercial and nutritional value, the antimicrobial and antioxidant properties of polyphenols from *T. tetrapтера* could be exploited through research. *T. tetrapтера* is already used in many local Ghanaian dishes as a spice but has not been exploited enough beyond this indigenous use. This study seeks to extract polyphenols and antioxidant compounds from *T. tetrapтера* and assess its potential application as a food preservative. This will result in making available a natural alternative food preservative for the local and international market from an already existing food material. It will also reduce dependence on chemical preservatives and as well reduce toxicity risks in the development of food products.

**Supervisor/Contact Name:** Dr Courage Sedem Dzah

#### **Project and Research Assistant Intern II**

<b>Project Objectives</b>	<b>Internship tasks</b>	<b>Expected Outputs</b>
The Project Assistant Intern will join the project team at HTU's department of Food Science and Technology to research and produce reports of findings to aid in decision making about the importance of <i>T. tetrapтера</i> polyphenols for various usage.	<p><b>Task 1.</b> Research and understand the information about HTU, department of Food Science and Technology and the Polyphenols project</p> <p><b>Task 2:</b> Optimize and extract polyphenols from <i>T. tetrapтера</i> using hot water, ethanol maceration, microwave assisted and Soxhlet extraction techniques.</p> <p><b>Task 3.</b> Assess the antioxidant capacity of extracts of the different extraction methods.</p> <p><b>Task 4.</b> Assess the antimicrobial properties of extracts of the different extraction methods.</p> <p><b>Task 5.</b> Assess the potential food preservative properties of the different polyphenol extracts.</p>	<p><b>Deliverable 1:</b> A presentation about HTU, mandate of the department of Food Science and Technology and a summary for the Polyphenols project.</p> <p><b>Deliverable 2:</b> <i>T. tetrapтера</i> polyphenols extracted optimally using the different methods and their yields computed.</p> <p><b>Deliverable 3.</b> Results on the antioxidant capacity of the extracts obtained and compared.</p> <p><b>Deliverable 4.</b> Results on the antimicrobial properties of the extracts obtained and compared.</p> <p><b>Deliverable 5.</b> Results on preservative potential of extracts based on shelf-life analysis, sensory and microbial assessment obtained and compared.</p>

### **Future studies**

After the preliminary screening and assessment of extracts from the different extraction techniques, the following will be done in collaboration with faculty and researchers:

1. Complete characterization of *T. tetraptera* polyphenols in extracts to identify and establish structure-function relationships.
2. Toxicity studies on extracts to ascertain their safety through both *in vitro* and *in vivo* techniques.
3. Optimal extraction on large scale using the best technique from comparative assessments.
4. Further studies to expand potential application of extracts in the food and pharmaceutical industry.

**Number of Interns:** 2-3

**Proposed Start Date:** 2022-09-1

**Proposed End Date:** Flexible (possibility of extension)

**Number of Work Hours per Week:** part-time/ full-time

**Additional Information:** The internship can be either remote or hybrid. There is a possibility of arranging for traveling in compliance with travel directives proved by HTU, McGill, and local government.