PROPOSAL TO OFFER A NEW DEGREE PROGRAM*

Proposals will only be accepted electronically as a Word document to the Office of the Provost when submitted to provost.deg.changes@wsu.edu

If a new unit will be created to offer the proposed degree, a notice of intent to establish the new unit (program, department, or school) will also be required.

This proposal will be circulated to other institutions in the state via the Interinstitutional Committee for Academic Program Planning (ICAPP). You may be asked to interact with other institutions if they have questions or concerns.

Degree Title:	Master of Science in Sustainable Fuels
Academic Program:	Master of Science in Sustainable Fuels
Academic Plan:	Master of Science in Sustainable Fuels
Number of Credits:	30
Department(s) or Program(s):	Biological Systems Engineering
College(s):	CAHNRS
Campus(es):	Global Campus
Method of Instructional Delivery:	Asynchronous Online Delivery

Contact Name:	Kelly Newell	Email Address:	knewell@wsu.edu
Contact Phone:	509-335-4247	*Proposed start date:	Spring 2026

Proposed Start Date: Approval must be received from the Northwest Commission on Colleges and Universities before the program may be advertised or recruited for. Financial aid may not be available until the program has been approved by the Department of Education subsequent to NWCCU approval. Approval notification will be sent by the Office of the Provost and Executive Vice President.

Proposal

Mission and Core Themes (Strategic Goals):

Provide a clear statement of the nature and purposes of the new degree in the context of WSU's mission and core themes (strategic plan).
The major airframe producers Boeing as well as Airbus, Embraer and Bombardier, all project global increases in travel of at least 5 percent per year, with annual passenger miles nearly tripling over the next 20 years. This requires tremendous supplies of aviation fuels for traveling. Sustainable aviation fuels (SAF) offer the potential to reduce the net environmental impact of aviation-related emissions, while enhancing energy security and diversifying energy supplies. As a result, these SAF technologies are receiving considerable attention from policymakers, industry and academia and a significant number of employees in SAF are needed. The Master of Science in Sustainable Fuels (MSSF) is a professional master's degree offered fully online via the Global Campus which is comprised of three stand-alone certificates and a 3-credit capstone course. Our program provides a solid foundation in the fundamentals of Sustainable Fuel Production (SFP) with technical and business expertise in specialized areas of the field. It advances the WSU mission as a land-grant university in service to society through advancing knowledge across academic disciplines and application of knowledge that enhances quality of life and the economy of the state, nation and world.

Additionally, by offering this degree online through the Global Campus, this degree will address WSU system strategic goal of outreach, extension and engagement. Additionally, the department of Biological Systems Engineering is working closely with industry to ensure a robust, engaging student experience that will directly prepare graduates for a career in sustainable aviation fuels production which directly addresses WSU system goal #2 of Student Experience.

The faculty members in the MSSF program are leading experts in their respective disciplines. Our faculty members lead academic instruction and research activities in bioenergy and bioproducts systems to solve engineering problems, achieve the best practical engineering outcomes, and develop engineering models for sustainable aviation fuel production to serve diverse communities and industries.

By offering the proposed degrees online, WSU creates access to high-quality degrees in a high-demand discipline to those who may not be able to avail themselves of the physical campus degree. The Global Campus degree serves remote and international students, working professionals, and those who are place-bound for diverse reasons.

Educational Offerings:

Describe the degree program, including the total number of credits required. Provide the four-year degree plan (undergraduate) or appropriate plan of study (graduate and professional).
Please note that all courses for the degree must be approved before the degree will be reviewed by the Catalog Subcommittee.

The online program will allow place-bound students the same opportunity to earn a Master's degree as students who are not place-bound. In addition, the program gives access to students who prefer the convenience of the Global Campus without having to relocate. As a professional master's degree program the degree is designed to meet the needs of aspiring and working professionals and adult learners. It will also provide opportunities for working professionals to refresh and update their skills and for those seeking to change careers. It offers all the opportunity to raise their credentials to WSU standards.

Additionally, the department intends to create relevant and desirable certificate programs that will appeal to those who desire upgraded credentials but are not interested in a full degree program.

Currently, BSE master students in the biological and agricultural engineering program specializing in bioenergy and bioproduct engineering complete a 30 credit MS program. We seek to add 3 certificates with total 27 hours plus a 3 hour Capstone in the MSSP and providing current and future BSE students an opportunity to earn another degree in their professional careers via completion of an additional 27 hours (2 cretificates plus Capstone) in MSSF.

See Exhibit A for degree plan

See Exhibit B for new course development and delivery schedule.

Provide descriptive information regarding (the) method(s) of instructional delivery (percent face-to-face, hybrid, distance, and/or competency-based).
The courses will be offered asynchronously online via WSU Global Campus and the WSU Learning Management System. Students will access all courses via online delivery and will utilize 16-week semester-based courses.

Assessment of Student Learning and Student Achievement
*** For graduate programs, please contact the Graduate School before completing this section.**

Please provide a list and description of expected student learning outcomes.
MSSF faculty are working with Scott Avery, Director of Data Management and Assessment in the Graduate School to formulate a comprehensive assessment plan for this degree in time for the degree to become operationalized.

For undergraduate programs, provide the department's plan for assessing student learning outcomes. Describe briefly how information on student learning will be collected and incorporated into existing processes for evaluating student learning in the department. Please attach the plan and a curriculum matrix.
N/A

Please indicate as appropriate:

- ☐ Assessment of this program will be incorporated into the existing assessment plan for _____. Please attach a copy of the existing plan.
- ☐ A draft assessment plan is attached.
- ☐ A curriculum matrix is attached.

Planning:

Describe plans and include descriptions which provide evidence of: 1. The need for the change

A professionally oriented master's degree program is an academic degree that prepares or enhances the preparation of a student in a particular profession by increasing competency in a set of knowledge and skills required in practice. Professions such as engineering often require an engineering degree in a specialty area to qualify engineers for a career in a related field, and a MS degree certainly move career forward by giving professionals a leg up in salary negotiations and by opening the door to greater job opportunities. Some high-level jobs require at least a graduate degree to develop skills to prepare for the duties of the role and increase their expertise and focus on engineering specialties. The professionally oriented master's degree program relies heavily on a competency curriculum that may include required practicum, engineering design and analysis, and a final capstone experience that applies the knowledge, skills, and training to a problem with the profession.This MSSF is a new addition to studies in the CAHNRS thus providing opportunity that has not existed previously.

The proposed online master's degree in Sustainable Fuels addresses a critical need for specialized knowledge and skills in a rapidly evolving field. With growing industry demand, diverse career opportunities, strong student interest, and the potential for significant global and local impact, this program can attract a wide range of students and contribute to the field of sustainable aviation fuel production and environmental stewardship.

Additionally, WSU is a recognized leader in the research and development of sustainable fuels with advanced research, collaborative partnerships, expert faculty, and contributions to real-world applications in this industry. This will be the first online master's of its kind, and should be attractive to students wishing for a degree in the sustainable fuel industry studying with world class faculty. It will be particularly relevant to members of round tables working around the world to create new production and commercialization facilities.

2. The student population to be served
Provide realistic justification for the projected FTE.
How can transfer students articulate smoothly into the program and complete it with approximately the same number of total credits as students who enter WSU as freshmen?
Please describe specific efforts planned to recruit and retain students who are persons of color, disabled, or whose gender is underrepresented in this discipline.

The Global Campus primarily serves working adults seeking additional skills and educational attainment. The Global Campus employs numerous recruiters and marketing professionals who seek appropriate students for all degree programs, though the College of Agriculture, Human, and Natural Resource Sciences (CAHNRS) and the Department of Biological Systems Engineering (BSysE) will be primarily responsible for marketing and recruiting directly related to this specific degree program.

BSysE will utilize industry contacts and partnerships to encourage students from across the state and the world to enroll in this degree program. Additionally, the format of the stackable certificates allows students a lower barrier-to-entry for this degree program as an individual certificate only requires a 2.5 GPA to enroll as a certificate-seeking student. Once in the certificate, students who apply for the full master's degree must maintain a 3.0 GPA.

This is a novel degree program with very few peers with which to compare. Estimated FTE will serve as target goals for recruitment and are based on other master's programs launched via WSU Global Campus. CAHNRS, WSU Global and BSysE will ensure a targeted and focused marketing strategy to encourage enrollments.

Although master's level enrollments at WSU Pullman have been in decline recently, we believe this unique degree will attract a large number of new students for a number of reasons. The aviation sector is increasingly focusing on sustainability due to regulatory pressure and consumer demand, which is expanding the job market in the sustainable fuel industry. This program is unique and first-to-market to fill a critical gap in available education at this level. The online format allows us to attract students from across the country and the world, and appeals to working professionals who may not have the desire or resources to attend an in-person program. WSU has strong

partnerships in this industry and with other governmental organizations which will enhance the program's credibility and provide network opportunities for students.

As with all online degree programs, enrollment will be closely monitored and should enrollment targets not be met, after every effort to recruit students has been exhausted, the program will be sunset and phased out slowly to ensure all students have the opportunity to complete their degree.

In addition to the desirability of the degree program itself, the three graduate certificates undergoing approval should draw enrollments to the courses that will supplement the full-degree-seeking enrollments and those numbers are not included in the budget projections.
The three graduate certificates are:
Certificate 1: SF Production Technologies
Certificate 2: SF Law and Policies and Systems View
Certificate 3: SF Fuel and Combustion

3. Procedures used in arriving at the decision to change (e.g., consultation with advisory boards, input from industry or employers, commissioned studies, faculty task force, etc.).

The decision to offer the degree was based on the evolution of sustainable fuels over the years during which the concerns about conversion technologies, cost, access, effectiveness and efficiency in SF production moved to the forefront of a national and international agenda. The preparation of SF engineers and administrators required education of leadership in technologies and policies to achieve new national and international aims. The goal of providing that education to students and professionals is met with the creation of both certificates and an MSSF degree. Additionally, the Dept. BSE has commissioned numerous market demand analyses in overall need for programs in the Washington State, the Pacific Northwest, national, and international. SF is an alternative to petroleum fuels. US consumed about 25 billion gallons of jet fuel in 2023. The global aviation fuel market size was valued at USD 391.23 billion in 2023 and is projected to grow from USD 431.70 billion in 2024 to USD 819.73 billion by 2032, exhibiting a CAGR of 8.35% during the forecast period, according to Fortune Business Insights report. SF is produced from agricultural and waste feedstocks and is consumed in blends with petroleum fuel. The SF market is experiencing robust growth propelled by several key factors. Heightened global awareness of climate change and the imperative to reduce carbon emissions in the aviation industry are primary drivers, leading airlines to adopt sustainable aviation fuel as a cleaner alternative to traditional jet fuels. Regulatory initiatives and mandates, including those from the International Civil Aviation Organization (ICAO) and various governments, further accelerate market expansion. The White House also set a goal of meeting 100% of U.S. aviation fuel demand with sustainable aviation fuel by 2050. The global sustainable aviation fuel market size is projected to grow from USD 1.1 billion in 2023 to USD 16.8 billion by 2030, at a ACAGR of 47.7% from 2023 to 2030. Sustainable aviation fuel production facilities increased dramatically from several in 2015 to 329 in 2024, with US sustainable aviation fuel production facilities of 102. Those studies unfailingly refer to MSSF administration and leadership as high-demand areas in terms of degrees, professional certificates, and jobs.

4. Organizational arrangements required within the institution to accommodate the change.

SAFP plans to leverage existing faculty and teaching resources, including BSE and newly established Institute for Northwest Energy Futures located on the WSU Tri-Cities campus, to minimize extra costs, if any. In addition, the current marketing and recruiting efforts will be expanded to the online degree, including, but not limited to:

- Alumni
- Advisory board
- Governments (local, state, national, international)
- Sustainable fuel Organizations and Corporations
- Sustainable fuel production Partners in SF Education

- Graduates of the Certificate in MSSF Program

The program architecture is as follows: the Master's Program will be directed by Hanwu Lei, Professor of bioenergy and bioproducts engineering at Dept. BSE for oversight to whom faculty and students are accountable. He is responsible for the management of any changes to the program. The MSSF Admissions Department, headed by Manuel Garcia-Perez, Chair of Dept. BSE, is responsible for the admissions process. A coordinator will be hired to manage the processes and procedures including academic advising, coaching, and remediation (if needed) as informed by the assessment and evaluations. The GC team provides technical support.

5. Lay out a three-year timetable for implementation, including hiring plans, partnership contracts if needed, facilities modification, recruiting, and other elements of implementation. Provide dates for each step.

2024-2025	Course development (see course development schedule, Exhibit B) Begin marketing/recruitment for certificates Begin offering the online certificates Spring 2026
2025-2026	Continue course development Continue marketing/recruitment for certificates and professional master's degree Begin assessment of certificates Begin offering the online master's degree Spring 2026
2026-2027	Monitor enrollment in individual courses; revise frequency of offerings as indicated Continue marketing

Budget:

☒Attach the Financial Worksheet with five-year FTE, revenue and expenditure projections. Fully account for costs such as staff support, training, library, facilities and so on.

Please describe the funding picture narratively, including funding sources, department, college and/or campus commitments, investments already made, one-time costs, facilities costs (labs, classrooms, offices, telecom etc.) and library costs.

The department is not planning to hire any new faculty to create the online degree. Instead, the courses will be created by existing faculty in concert with their on-campus courses or necessary thought leaders (i.e., adjuncts) will receive stipends to teach specific content.

Career track faculty will be recruited to teach the courses once current faculty have created the courses for online delivery. At stasis, we will need 2 FTE for instruction.

Additionally, the department is proposing $800 per credit to be in line with current online degree trends. This additional tuition revenue will incentivize the department and college and support the growth of the program through marketing and corporate relation activities and continuous program improvement.

We will offer summer courses depending on demand and a survey result from enrolled students.

Please see Exhibits C for the budget model details and enrollment projections.

Student Services:

Describe the capacity of student support services to accommodate the change at this location. Include a description of admissions, financial aid, advising, library, tutoring and other services specific to this request.
The Global Campus provides comprehensive student services, often in collaboration and cooperation with the centralized units, to ensure student success. Included are dedicated recruiters, transfer credit evaluation, career counseling, financial aid, e-tutoring, student involvement, and tech support for online students. The Global Campus is also skilled in working with students to match their goals with the programs and services offered by WSU. Additionally, WSU Global Campus personnel are the experts on adult and contemporary distance learners and provide specialized services to meet the needs of these unique students. WSU Global Campus creates opportunities for meaningful student engagement through unique student involvement activities offered virtually and face-to-face. The Global Campus provides a robust infrastructure of support programs to assist students enrolled at any degree level, CAHNRS will provide advising to the students enrolled and will handle all admissions decisions.

Describe the implications of the change for services to the rest of the student body.
Adding online courses and creating access to a new degree program adds opportunity and options for student success and flexibility that accommodates students' needs. Current students should not be negatively affected by the delivery of this new degree program and modality. Additionally, students and faculty from other WSU campuses will be able to participate in the courses (teaching and learning) when appropriate.

Physical Facilities and Equipment:

Outline the provision/s made for physical facilities and equipment at the proposed location that will support the program and its projected growth. Include videoconferencing and other technologies that support course delivery as well as classrooms, labs, and office space.
None. All online courses are fully supported by the Global Campus through the Learning Management System

Library and Information Resources:

Using the Library Analysis form, describe the availability and adequacy of library and information resources for this degree, degree level, and location. Note plans to address gaps.
This degree program will not require any new resources from the WSU Library to support students. The library currently offers access to relevant electronic journals and the online students will continue to have access to those.

Faculty:

List the educational and professional qualifications of the faculty relative to their individual teaching assignments.

List the anticipated sources or plans to secure qualified faculty and staff.
Existing and stipend/adjunct faculty will develop and teach the online courses. All faculty teaching online are held to the same qualifications as faculty on the physical campuses. Deans and Directors are directly responsible for the hiring of all teaching faculty and ensure credentials are appropriate for the program and will hire faculty using normal hiring processes. Content experts will be given a stipend and rank of adjunct faculty for delivery of the coursework that is beyond the capacity of the current faculty.

Impact on Other Locations/Programs:

Briefly describe any impacts on other WSU programs and locations, and how you came to these conclusions (who was consulted?). If there are potential adverse impacts, describe how these will be addressed. Consider such things as: reallocation of faculty time, reallocation of AMS courses, impact of blended courses, internal competition, "cannibalization" of other programs, curricular effects for other degrees, effects on recruitment markets for other campuses. Indicate how such problems will be addressed for each campus or department affected.
The Dept. BSE will offer three constituent certificates constituting 30 credits for this degree. MS students from MSSF needs 30 credits to satisfy the course requirement. We will scale instruction to meet demand as they do with all BSE enrollments. No additional funding is required to launch the certificates and all MSSF courses will fall under the current BSE funding model. Our Certificate of Sustainable Fuel and Combustion will involve Professor Joshua Heyne from WSU TriCities campus, who is an expert on fuel analysis certification, standardization, fuel combustion and emissions. His work has focused on the development of sustainable aviation fuels, and his role includes the integration and coordination activities of the National Jet Fuels Combustion Program of the FAA's ASCENT Center of Excellence. WSU Tri-Cities and Snohomish County are partners for a $6.5 million Sustainable Aviation Fuel (SAF) Applied Research and Development Center (SAFARDC) located at Paine Field in Snohomish County. The first-of-its-kind center will offer fuel testing, fuel finishing and the world's first fuel repository. As the WSU Everett is located at the most populous city of Snohomish County. This MS program with Prof. Heyne's involvement at SAFARDC will enhance the collaboration among WSU campuses to advance sustainable fuels around the globe. This MS program and Heyne's involvement are strongly supported by Chancellor Sandra Haynes at WSU Tri-Cities. We anticipate very few impacts on other WSU programs or locations in the CAHNRS as this is a new program. BSysE will ensure that courses will be available to students at other campuses through blended sections. Because this is a new and novel degree program, we do not anticipate any "cannibalization" from other programs.

Sustainability

What are the plans for continuing the program past 5 years if the goals for enrollment are not met, or other circumstances prevent the execution of the plan described here?
All new online degree programs will be evaluated continuously for enrollment and financial metrics. Under-performing degrees will be sunset once the college, department, and Global Campus have explored all reasonable efforts to increase enrollments and revenue through marketing, partnerships, and innovation. However, prior to sunsetting (phasing out a degree for non-enrollment performance) a degree, the need for the courses that are provided online will also be analyzed to ensure little to no impact on other departments and programs that rely on those courses. Any degree that is discontinued will include an appropriate teach-out plan and students will be supported to completion of the degree.

External Reviews

If this program is new to the Washington State University system, please provide the names and addresses of 2-3 external experts from similar institutions who could be contacted to provide reviews of this program.	
Name	**Contact Information (email, phone, address)**

Dr. Prem Lobo	Member of the Transportation Research Board's (of the National Academies) standing committee, Chair of the Alternative Aviation Fuels subcommittee, Prem.Lobo@faa.gov
Dr. Kristin Lewis	Principal Technical Advisor for energy analysis and sustainability at the U.S. DOT Volpe Center, Kristin.Lewis@dot.gov

Attachments:

- ☒ Financial Worksheet
- ☒ Library Analysis
- ☒ Four-Year Degree Plan (undergraduate); curriculum overview (graduate and professional)
- ☐ Curriculum Map (undergraduate)
- ☐ Assessment Plan
- ☒ Letters of financial commitment

Submit completed form as a Word document to the Provost's Office at provost.deg.changes@wsu.edu

SIGNATURES: The names typed below certify that the relevant academic and campus officials have reviewed and approved this proposal:

Chair or Director Signature:		Date:	
Dean Signature:		Date:	

Signatures are required from all Chancellors (or delegates). A signature denotes endorsement if the degree will be offered and/or impact the respective campus. A signature will also denote receipt of notification if the degree is not being offered and/or will impact the respective campus. If needed, a signature abstention box is provided immediately below.

Everett Chancellor Signature:		Date:	
Global Chancellor Signature:		Date:	
Pullman Chancellor Signature:		Date:	
Spokane Chancellor Signature:		Date:	
Tri-Cities Chancellor Signature:		Date:	
Vancouver Chancellor Signature:		Date	

Comments regarding abstention of signature(s)
All chancellors were consulted in the NOI phase earlier this fall. In an effort to meet the October 1st deadline, this proposal has been submitted prior to obtaining all chancellor signatures. However, this proposal has been shared with all chancellors concurrent with the submission and as responses are received, they will be submitted as supplements to this original proposal.

Submit completed form as a Word document to the Provost's Office at
provost.deg.changes@wsu.edu

Provost's Office Signature:		Date:	

For Registrar's Office Use Only:					
Current CIP Code:		New CIP Code:		Date:	

Exhibit A

Program Requirements for the Degree

The Master of Science in Sustainable Fuels is a professional master's degree offered fully online via the Global Campus which is comprised of three stand-alone certificates and a 3-credit capstone course. A total of 30 semester credits are required based on course-work only. One certificate is offered in collaboration through the WSU TriCities (12 credits). The other 24 credits will be taken from the Dept. BSE in the form of two certificates and a capstone course. Certificates may be taken in any order and successful completion of any certificate with a 3.0 GPA or better will guarantee admission to the MS SF. The capstone course must be taken in the final semester of a student's progress toward graduation, but is not required for those simply accessing the certificates. In order to stack the 3 certificates to make a full degree, students must take two elective courses from the E_M program to meet total credit requirements.

For a Certificate: Take two of the common classes and two of the specialized classes.

For Master Program: Take 10 courses, two common and other 7 courses + capstone project. Students who are stacking 3 certificates must also choose 2 electives from the following ETM courses:

E_M 540 Operations Research and Analytics for Managers
E M 564 Project Management
E_M 565 Introduction to Systems Management
E M 575 Managing Innovation: Strategy and Performance
E M 590 Leading Design and Innovation

Common Classes:

Sustainable Fuels Technologies	SF 502	3 Credits
SF law, policies and Regulations	SF 506	3 Credits
Feedstock Assessment	SF 507	3 Credits

Certificate 1: SF Production Technologies

Description: This certificate consists of 12 graduate credit hours and provides the student the opportunity to explore production technologies related to the sustainable fuels. The topics include biomass and bioenergy, conversion technologies, design and optimization of SF process systems, renewable Energies and hydrogen potential for SF industries, SF quality measures and their application, contexts of process development, the skill of assessing technologies, fundamentals of technoeconomic analysis (TEA), TEA examples, finances and investment. In the SF production system, effectiveness and conversion efficiency related to desired outcomes, as well as constraints are presented. This certificate will stack with two other certificates and a capstone course as 1/3 of the Masters of Science in Sustainable Fuels degree which will be proposed to the Provost and Faculty Senate in Fall of 2024 for launch in Spring 2026.

Catalog Description: SF exists in a field of high stakes force factors. Learn the principles and values in the aim to decrease waste and increase the conversion technologies efficiency, system analysis and modeling.

Courses Required: two of the following specialized classes

Biomass Conversion Technologies	SF 501	3 Credits
Renewable Electricity and Hydrogen	SF 503	3 Credits
SF TEA, Financing and Investment	SF 505	3 Credits

Certificate 2: SF Law and Policies and Systems View

Description: This certificate consists of 12 graduate credit hours. This certificate will stack with two other certificates and a capstone course as 1/3 of the Masters of Science in Sustainable Fuels degree which will be proposed to the Provost and Faculty Senate in Fall of 2024 for launch in Spring 2026.

This certificate provides the student the opportunity to learn the fundamentals of operations that guide organizations, including SF related organizations and companies. These fundamentals include: GPS, fundamentals of transportation economics, biofuel supply logistics, examples of supply chains, identification of optimal locations, supply chain analysis/optimization (examples), system analysis and operations, fundamentals of systems dynamics, examples of systems dynamics, life cycle assessment, and LCA examples, book and claim, and the skill of assessing information sources are analyzed. These fundamentals will equip SF managers with an analytical toolbox to solve the typical problems faced by managers.

Catalog Description: Raise your business operation acumen through engagement of principles and applications that sustain optimal performance, with foundational topics of sustainable engineering principles, supply chain, life cycle assessment and monetization of environmental services to improve productivity.

Courses Required: two of the following specialized classes

SF Life Cycle Assessment	SF 504	3 Credits
SF System Dynamics	SF 508	3 Credits
SF Supply chain analysis and optimization	SF 509	3 Credits

Certificate 3: SF Fuel and Combustion

Description: This certificate consists of 12 graduate credit hours, and provides the student the opportunity to enhance their skills in aviation fuel analysis, understanding aviation fuel standardization, and pathways for SF companies to obtain SF certification for commercial operations. Students learn analytic tools to test aviation fuels. This certificate will be offered from WSU TriCities and stack with two other certificates and a capstone course as 1/3 of the Masters of Science in Sustainable Fuels degree which will be proposed to the Provost and Faculty Senate in Fall of 2024 for launch in Spring 2026.

Catalog Description: The SF professional looking to develop analytic testing skills and test sustainable fuels to meet the ASTM standards, and analyzes various aviation fuels from research and development team. Students engage best practices in using analytical equipment to test and meet the ASTM requirement.

Courses Required: two of the following specialized classes

SF Fuel analysis Certification and Standardization	SF 510	3 Credits
SF Combustion and Emissions	SF 511	3 Credits

Final Capstone Course (To be completed in the student's final semester):

Capstone course	SF 600	3 Credits

Exhibit B

Course Development Plan

Course #	Course Title	Desired Development Term	Desired Delivery Term	Course Developer (faculty or Grad student)	Course Instructor
SF 501	Biomass Conversion Technologies	Fall 2024, 2025	Spring 2026	Manuel Garcia	Manuel Garcia
SF 502	Sustainable Fuels Technologies	Fall 2024, 2025	Spring 2026	Manuel Garcia, Birgitte Arhing	Manuel Garcia, Birgitte Arhing
SF 503	Renewable Electricity and Hydrogen	Fall 2024, 2025	Spring 2026	Hanwu Lei	Hanwu Lei
SF 504	SF Life Cycle Assessment	Fall 2024, 2025, Spring 2026	Fall 2026	Lina Martínez, Manuel Garcia, Bin Yang	Lina Martínez, Manuel Garcia, Bin Yang
SF 505	SF TEA, Financing and Investment	Fall 2024, 2025, Spring 2026	Fall 2026	Lina Martinez, Bin Yang	Lina Martinez, Bin Yang
SF 506	SF law, policies and Regulations	Fall 2024, 2025, Spring 2026	Fall 2026	Lina Martinez	Lina Martinez
SF 507	Feedstock Assessment	Fall 2024, 2025, Spring 2026	Spring 2027	Kirti Rajagopalan, Manuel Garcia-Perez, Hanwu Lei	Kirti Rajagopalan, Manuel Garcia-Perez, Hanwu Lei
SF 508	SF System Dynamics	Fall 2024, 2025, Spring 2026	Spring 2027	Lina Martinez	Lina Martinez
SF 509	SF supply chain analysis and optimization	Fall 2024, 2025, Spring 2026	Spring 2027	Eric Jessup	Eric Jessup
SF 510	SF Fuel analysis Certification and Standardization	Fall 2024, 2025, Spring 2026	Fall 2027	Josh Heyne	Josh Heyne
SF 511	SF Combustion and Emissions	Fall 2024, 2025, Spring 2026	Fall 2027	Josh Heyne	Josh Heyne
SF 600	SF Capstone	Fall 2024, 2025, Spring 2026	Fall 2027	Manuel García-Perez, Hanwu Lei, Birgitte Ahring, Joshua Heyne, Lina Martinez	Manuel García-Perez, Hanwu Lei, Birgitte Ahring,

					Joshua Heyne, Lina Martinez

Exhibit C

Budget

See attached electronic file for more legible versión

Proposed Program	**Sustainable Aviation Fuels Production**					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	
Enter the fiscal year begin date of program (e.g. 2022 for Fall-21)	**2026**	**2027**	**2028**	**2029**	**2030**	
Enter total student headcount enrolled per year	**15**	**30**	**45**	**60**	**75**	
Enter student credit hours (estimated), per student, per year	**15**	**15**	**15**	**15**	**15**	
Enter anticipated tuition waivers or discounting granted (e.g. -10000)	$0.00	$0.00	$0.00	$0.00	$0.00	
Enter tuition rate per student credit hour to be charged in this program	$800.00	$800.00	$800.00	$800.00	$800.00	
Total student credit hours per student, per year, eligible for payout (State)	0	0	0	0	0	-
Total student credit hours per student, per year, eligible for payout (Self Sus)	0	0	0	0	0	-
Annual operating tuition, per full-time student	$12,000	$12,000	$12,000	$12,000	$12,000	
Total number of student credit hours delivered per year	225	450	675	900	1,125	**3,375**
Student credit hours available to be paid out through this program	225	450	675	900	1,125	
Total tuition earned through Masters' offerings, before waivers (State)	$140,051	$280,103	$420,154	$560,205	$700,256	
Total tuition earned through Masters' offerings, before waivers (Self Sust)	$180,000	$360,000	$540,000	$720,000	$900,000	**$ 2,700,000**
Academic Program Direct & Indirect Costs						
Faculty Instruction Costs						
Faculty 1 Name	Current Faculty	Current Faculty	Current Faculty	Current Faculty	Current Faculty	
Academic Year Salary	$ 130,000	$ 132,600	$ 135,252	$ 137,957	$ 140,716	
Percent of time dedicated to this program (e.g. 25)	25%	0%	0%	0%	0%	
Employee's benefit percentage (e.g. 28)	28%	0%	0%	0%	0%	
Salary & benefits dedicated to this program	**$ 41,600**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 41,600**
Faculty 2 Name	Current Faculty	Current Faculty	Current Faculty	Current Faculty	Current Faculty	
Academic Year Salary	$ 130,000	$ 132,600	$ 135,252	$ 137,957	$ 140,716	
Percent of time dedicated to this program (e.g. 25)	25%	0%	0%	0%	0%	
Employee's benefit percentage (e.g. 28)	28%	28%	28%	28%	28%	
Salary & benefits dedicated to this program	**$ 41,600**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 41,600**
Faculty 3 Name	Adjuct	Adjunct	Adjunct	Adjunct	Adjunct	
Academic Year Salary	$ -	$ -	$ -	$ -	$ -	
Percent of time dedicated to this program (e.g. 25)	0%	0%	0%	0%	0%	
Employee's benefit percentage (e.g. 28)	0%	0%	0%	0%	0%	
Salary & benefits dedicated to this program	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Faculty 4 Name	New Hire	New Hire	New Hire	New Hire	New Hire	
Academic Year Salary	$ 93,000	$ 94,860	$ 96,757	$ 98,692	$ 100,666	
Percent of time dedicated to this program (e.g. 25)	50%	200%	200%	200%	200%	2 FTE after Yr 2
Employee's benefit percentage (e.g. 28)	28%	28%	28%	28%	28%	
Salary & benefits dedicated to this program	**$ 59,520**	**$ 242,842**	**$ 247,698**	**$ 252,652**	**$ 257,705**	**$ 1,060,418**
Direct Instructional Support Salaries & Benefits						
Employee 1 Name	Academic Coord	Academic Coord	Academic Coord	Academic Coord	Academic Coord	
Annual Salary	$ 80,000	$ 81,600	$ 83,232	$ 84,897	$ 86,595	
Percent of time dedicated to this program (e.g. 25)	20%	20%	30%	40%	50%	
Employee's benefit percentage (e.g. 28)	28%	28%	28%	28%	28%	
Salary & benefits dedicated to this program	**$ 20,480**	**$ 20,890**	**$ 31,961**	**$ 43,467**	**$ 55,421**	**$ 172,218**
Administrative Leadership Support (Chair)	Chair	Chair	Chair	Chair	Chair	
Annual Salary	$ 200,000	$ 204,000	$ 208,080	$ 212,242	$ 216,486	
Percent of time dedicated to this program (e.g. 25)	5%	5%	5%	5%	5%	
Employee's benefit percentage (e.g. 28)	28%	28%	28%	28%	28%	
Salary & benefits dedicated to this program	**$ 12,800**	**$ 13,056**	**$ 13,317**	**$ 13,583**	**$ 13,855**	**$ 66,612**
Marketing Support						
Annual Salary	$ -	$ -	$ -	$ -	$ -	
Percent of time dedicated to this program (e.g. 25)	0%	0%	0%	0%	0%	
Employee's benefit percentage (e.g. 28)	0%	0%	0%	0%	0%	
Salary & benefits dedicated to this program	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Employee 4 Name						
Annual Salary						
Percent of time dedicated to this program (e.g. 25)						
Employee's benefit percentage (e.g. 28)						
Salary & benefits dedicated to this program	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Course Development Costs/Marketing Costs						**$ -**
Stipend for course updates			5,000	5,000	5,000	**$ 15,000**
Stipend for Development	15,000	7,000				**$ 22,000**
Marketing	5,000	3,000	1,000	1,000	1,000	**$ 11,000**
Direct Course Costs (Detail						
Goods and services - photocopies / supplies						$ -
						$ -
						$ -
						$ -
						$ -
Other (Detail						
Computers, Printers, Software	15,000	15,000	2,000	2,000	2,000	**$ 36,000**
						$ -
						$ -
						$ -
						$ -
Total Costs	**$ 211,000**	**$ 301,787**	**$ 300,977**	**$ 317,703**	**$ 334,981**	**$ 1,466,448**
				Check #	**$ 1,466,448**	

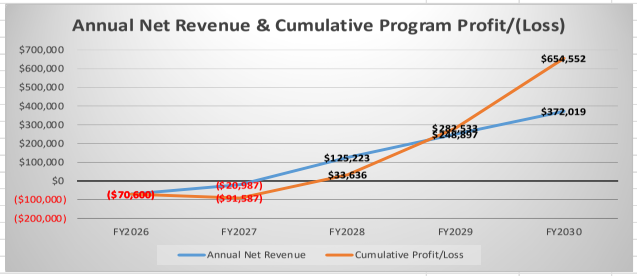
Program Name	Sustainable Aviation Fuels Production		Self-Sustaining Model

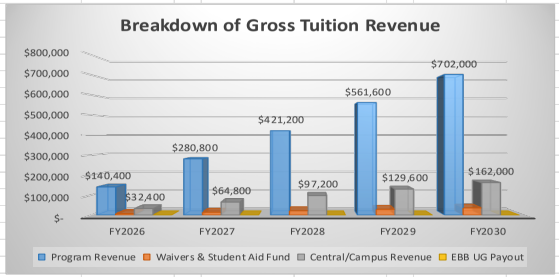
Tuition Earned	FY2026	% of Total Tuition	FY2027	% of Total Tuition	FY2028	% of Total Tuition	FY2029	% of Total Tuition	FY2030	% of Total Tuition	Cumulative	Cumulative %
Gross Operating Tuition - Masters Program (Excludes UG Tuition)	$ 180,000	100.00%	$ 360,000	100.00%	$ 540,000	100.00%	$ 720,000	100.00%	$ 900,000	100.00%	$ 2,700,000	100.00%
Less Waivers or Tuition Discounting - Masters	$ -	0.00%	$ -	0.00%	$ -	0.00%	$ -	0.00%	$ -	0.00%	$ -	0.00%
Net Tuition	**$ 180,000**	**100.00%**	**$ 360,000**	**100.00%**	**$ 540,000**	**100.00%**	**$ 720,000**	**100.00%**	**$ 900,000**	**100.00%**	**$ 2,700,000**	**100.00%**

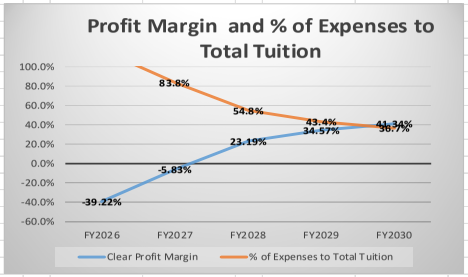
Split of Tuition by Area	FY2026	% of Total Tuition	FY2027	% of Total Tuition	FY2028	% of Total Tuition	FY2029	% of Total Tuition	FY2030	% of Total Tuition	Cumulative Total Tuition Split	Cumulative %
Sustainable Aviation Fuels Production	$ 140,400	78.0%	$ 280,800	78.0%	$ 421,200	78.0%	$ 561,600	78.0%	$ 702,000	78.0%	$ 2,106,000	78.0%
Tuition Waivers or Discounting	$ -	0.0%	$ -	0.0%	$ -	0.0%	$ -	0.0%	$ -	0.0%	$ -	0.0%
Campus Fee (5%)	$ 9,000	5.0%	$ 18,000	5.0%	$ 27,000	5.0%	$ 36,000	5.0%	$ 45,000	5.0%	$ 135,000	5.0%
Central (11% + 2% Strategic Reallocation)	$ 23,400	13.0%	$ 46,800	13.0%	$ 70,200	13.0%	$ 93,600	13.0%	$ 117,000	13.0%	$ 351,000	13.0%
Student Aid Fund (4%)	$ 7,200	4.0%	$ 14,400	4.0%	$ 21,600	4.0%	$ 28,800	4.0%	$ 36,000	4.0%	$ 108,000	4.0%
Total - Gross Tuition	**$ 180,000**	**100.0%**	**$ 360,000**	**100.0%**	**$ 540,000**	**100.0%**	**$ 720,000**	**100.0%**	**$ 900,000**	**100.0%**	**$ 2,700,000**	**100.0%**

Direct & Indirect Costs for Academic Program	FY2026 Program Costs	% of Program Revenue	FY2027 Program Costs	% of Program Revenue	FY2028 Program Costs	% of Program Revenue	FY2029 Program Costs	% of Program Revenue	FY2030 Program Costs	% of Program Revenue	Cumulative Program Costs	Cumulative %
Direct Instructional Salaries & Benefits	$ 142,720	101.7%	$ 242,842	86.5%	$ 247,698	58.8%	$ 252,652	45.0%	$ 257,705	36.7%	$ 1,143,618	78.8%
Direct Instructional Support Salaries & Benefits	$ 33,280	23.7%	$ 33,946	12.1%	$ 45,278	10.7%	$ 57,051	10.2%	$ 69,276	9.9%	$ 238,830	16.5%
Third Party Costs (Incl A.O.I. Level 2 / 3 Service)	$ 20,000	14.2%	$ 10,000	3.6%	$ 1,000	0.2%	$ 1,000	0.2%	$ 1,000	0.1%	$ 33,000	2.3%
Direct Course Costs	$ -	0.0%	$ -	0.0%	$ -	0.0%	$ -	0.0%	$ -	0.0%	$ -	0.0%
Other Costs	$ 15,000	10.7%	$ 15,000	5.3%	$ 2,000	0.5%	$ 2,000	0.4%	$ 2,000	0.3%	$ 36,000	2.5%
Total	**$ 211,000**	**150.3%**	**$ 301,787**	**107.5%**	**$ 295,977**	**70.3%**	**$ 312,703**	**55.7%**	**$ 329,981**	**47.0%**	**$ 1,451,448**	**100.0%**

	FY2026	%	FY2027	%	FY2028	%	FY2029	%	FY2030	%	Cumulative	Cumulative %
Profit or (Loss) & % of Profit to Program after all expenses are covered	**($70,600)**	**-39.2%**	**($20,987)**	**-5.8%**	**$125,223**	**23.2%**	**$248,897**	**34.6%**	**$372,019**	**41.3%**	**$654,552**	**24.2%**
Cumulative Profit/(Loss) to Date	**($70,600)**		**($91,587)**		**$33,636**		**$282,533**		**$654,552**			
Amount Paid to Program per SCH	**$ 624**		**$ 624**		**$ 624**		**$ 624**		**$ 624**			
Amount Paid to Program per AAFTE	**$ 18,720**		**$ 18,720**		**$ 18,720**		**$ 18,720**		**$ 18,720**			
Clear Profit/(Loss) to Program per SCH	**($313.78)**		**($46.64)**		**$185.52**		**$276.55**		**$330.68**			
Clear Profit/(Loss) to Program per AAFTE	**($4,706.67)**		**($699.57)**		**$2,782.74**		**$4,148.28**		**$4,960.25**			







Fiscal Year	FY2026	FY2027	FY2028	FY2029	FY2030
Annual Net Revenue	($70,600)	($20,987)	$125,223	$248,897	$372,019
Cumulative Profit/Loss	($70,600)	($91,587)	$33,636	$282,533	$654,552

	FY2026	FY2027	FY2028	FY2029	FY2030
Program Revenue	$ 140,400	$ 280,800	$ 421,200	$ 561,600	$ 702,000
Waivers & Student Aid Fund	$ 7,200	$ 14,400	$ 21,600	$ 28,800	$ 36,000
Central/Campus Revenue	$ 32,400	$ 64,800	$ 97,200	$ 129,600	$ 162,000
EBB UG Payout	$ -	$ -	$ -	$ -	$ -

	FY2026	FY2027	FY2028	FY2029	FY2030
Clear Profit Margin	-39.2%	-5.8%	23.2%	34.6%	41.3%
% of Expenses to Total Tuition	117.2%	83.8%	54.8%	43.4%	36.7%