

**A Dual Degree Professional Master's Program in Food Science at  
Cornell University and Tamil Nadu Agricultural University (TNAU),  
Coimbatore, India**

**Proposer/Contact Information**

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**Program Information**

	<b>Current (if any)</b>	<b>Proposed (if applicable)</b>
<b>Program Title</b>		A Dual Degree Professional Master's Program in Food Science and Technology at Cornell University and Tamil Nadu Agricultural University (TNAU), Coimbatore, India
<b>Award (e.g., degree; certificate):</b>	Master of Professional Studies (M.P.S.) in Food Science and Technology (Cornell University)  Masters of Technology (M.Tech) in Food Processing and Marketing (TNAU)	Master of Professional Studies (M.P.S) (A.L.S) in Food Science and Technology awarded by Cornell University; & Masters of Technology (M.Tech) in Food Processing and Marketing (TNAU) awarded by TNAU.
<b>HEGIS Code:</b>		
<b>Program [SED]Code:</b>		

## **I. Proposal Narrative**

The Food Science program at Cornell is rated number one in its field in the U.S. and continues to evolve and launch new initiatives in response to global food industry changes. The global food industry needs graduates whose knowledge of food processing, value addition and marketing is complemented by international exposure and perspective.

Cornell has an opportunity to enhance its global preeminence in food science graduate education by establishing a dual degree program with the highly regarded Tamil Nadu Agricultural University (TNAU), a South Asian leader in agricultural education. The proposed partnership offers strong benefits to both Cornell and TNAU in the form of faculty professional development, curricula that more fully reflect the new face of the global food industry, and enhanced prospects for “fast track” professional placement and growth for both Cornell and TNAU food science graduates.

The Department of Food Science faculty, supported by International Programs/CALS, has acted decisively to develop a program consistent with the existing high academic standards and in the spirit of academic innovation essential to maintaining leadership. Several US Land Grants (e.g. University of California, Davis; Purdue University; Michigan State University and others) are pursuing curricular initiatives and international partnerships in order to better address the global needs in the food industry. Senior officials (Presidents and Deans) from these universities have visited India to identify dual degree options in several areas of agriculture and rural development. Competition for establishing academic partnerships with the top Indian agricultural universities is high among US Land-Grants (as well as with universities in Europe and Australia). We believe that this initiative advances Cornell’s reputation as a world-class academic institution and its vision for mutually beneficial engagement with top Asian universities.

### **Program Goals, Objectives and Expected Outcome**

The overall goal of this program is to deliver world-class food science graduate education through a high quality Cornell-TNAU dual master’s degree program. Objectives supporting this goal include 1) collaborative curriculum development that improves the “global readiness” of students, 2) new opportunities for both Cornell and TNAU faculty professional development, and 3) the establishment of transnational academe – food industry networks that offer expanded employment opportunities for graduates and potential support for graduate education. The proposed program will fill a currently unmet need for producing food industry leaders that can bring science, technology and management knowledge and skills together within an industry characterized by high levels of global integration.

To meet the above goal and objectives, the Field of Food Science and Technology at Cornell and TNAU propose to establish a dual Degree Master’s Program in Food Science, which will include a Master of Professional Studies (M.P.S) in Food Science and Technology to be offered by Cornell University; and Master of Technology (M.Tech) in Food & Agricultural Process Engineering to be offered in India by TNAU. The students will comply with stringent academic criteria for admission and graduation set by Cornell University and TNAU for securing the dual degrees.

## **Course (Program) Delivery Process**

The specific Master's degrees that will be offered through this program are:

### **M.P.S. (A.L.S) (FOOD SCIENCE AND TECHNOLOGY) (Cornell University)**

This is an existing degree program at Cornell designed to prepare students for direct employment in the food industry. Students learn aspects related to consolidation of the food chain, development of new food products, food science (food biology, food chemistry and food nutrition), bio-process engineering principles, product development and marketing. The proposed dual degree program offers the added benefit of transnational learning, global professional networks, and a deeper understanding of how science, technology and commerce intersect with socio-cultural context in the global food industry. Upon completion, students have an excellent opportunity for employment in the growing food-processing sector worldwide.

### **M.Tech in Food & Agricultural Process Engineering (TNAU)**

TNAU will use faculty from three departments—Food Process Engineering; Post Harvest Center; and Food Science and Nutrition Group to offer this Master's degree.

### **Admissions process**

Students admitted to the proposed dual degree program must meet admissions requirements for both TNAU and Cornell and will apply separately to both programs and go through separate admissions processes. TNAU's admission criteria include undergraduate academic performance and aptitude for transnational graduate study (GRE and TOEFL performance), in addition to rankings determined through some existing institutional evaluation procedures. As part of the dual degree program, students will also apply to TNAU for a fellowship to cover costs of their MPS degree at Cornell; students that will receive funding for the MPS portion of the dual degree program will obtain a letter that will be included in their application.

### **Dual degree time lines and plan of study - overview**

Dual degree students will begin their programs at Cornell starting in the summer, spending 6.5 months (summer and fall terms) in residence. The expected arrival date, on the Ithaca campus, for students in this program is June 1. Regular coursework will be complemented by special seminars, experiential learning in state of the art laboratories, and organized interaction with industry representatives on and off campus. In addition, students will be assigned a research project under the joint supervision of Cornell and TNAU faculty mentors. Research conducted during the first year will be presented to academic advisers during the second year. Students will be encouraged to pursue publication of their research results in international peer reviewed journals.

During the second semester the students will take part in an experiential learning module (Agriculture in the Developing Nations, offered by Cornell) that will bring together Cornell and Indian students to study development issues in agriculture through field visits in India. This will complement the field visit exposure the students will obtain during their stay in Ithaca. Also, during this course the students will be exposed to several lectures by faculty based in India and the USA. A group term paper or project is required,

based on the field trip experience and focused on general themes established in the previous semester. The objective of this course is to gain a better understanding of the problems of agricultural and rural development through first hand observations and subsequent analysis.

Additionally, Cornell faculty will teach existing Cornell courses (organized into three week modules) at TNAU during the third semester. Decisions regarding which courses and experiential learning activities are taught at which institution accounts for comparative advantage, the “spirit” of each institution’s existing academic regulations, and the best overall professional development experience for the students.

The decision to build this partnership around professional degrees in food science (MPS and M.Tech) is supported by a needs assessment study conducted by the Cornell-Sathguru Foundation for Development and the Indian Council for Agricultural Research (ICAR). India seeks a new cadre of agricultural graduates who can position it to be competitive in the regional and global agricultural economy, while retaining domestic markets. Cornell and Sathguru have been working in these areas and this proposed program builds on a decade-long effort in building experiential learning modules for such a program, as well as strengthening the core competencies in the College of Agriculture and Life Sciences at Cornell to offer this program.

The students will take three additional semesters of coursework in residence at TNAU in partial fulfillment of requirements for the M. Tech in Food and Agricultural Process Engineering. TNAU will recognize the credits secured by students at Cornell. See Appendix 1 for details of courses and credit requirements for the M. Tech in Food & Agricultural Process Engineering.

Our proposed approach is unique at this time. So far no other transnational university partnerships have organized to offer a similar dual degree program. Cornell’s dual degree in Food Science and Technology with TNAU would be the first of its kind offered anywhere in the developing world. It will address a growing need for well-prepared food science professionals who possess global experience and insights.

### **Detailed time lines for Cornell MPS degree**

This section briefly outlines the detailed time lines the students enrolled in this program would follow to complete their Cornell MPS degree.

#### Summer semester (6 credits):

Admitted students will arrive at Cornell by June 1 and will enroll into **6 credits** through the Cornell summer school in two courses for 6 credits, they can choose from the following courses: (i) FD SC 441 *Introduction to US Food Industry and Food Science research* (1 credit; a proposal to the summer schools for this course is currently being prepared); (ii) FD SC 442 *Advanced concepts in food engineering and processing* (1 credit; a proposal to the summer schools for this course is currently being prepared); and (iii) four credits of FD SC 497 *Individual study in food science*. Students will choose a MPS advisor before they arrive in Ithaca and will enroll into FD SC 497 with their assigned advisor as instructor; they will work with their assigned advisor to start their MPS Special Project in the summer.

Fall semester (at least 18 credits, with as much as 6 credits earned through the MPS Special Project; one registration unit [RU] will be earned this semester)

Students will be enrolled as full time students at Cornell. They will take a total of at least **18 credits**, with at least 12 credits in the area of study (e.g., FD SC courses for students enrolling in the dual MPS program in Food Science and Technology). These 18 credits will include 6 credits for their special MPS project. The table below lists some specific courses that would be highly suitable for students to be enrolled into this program with a major in Food Science and Technology, but students are free to take other appropriate courses after consultation with their advisor.

<b>Course number</b>	<b>Course Name</b>	<b>Credit hours</b>
FD SC 423	Physical Principles of Food Preservation & Manufacturing	3
FD SC 406	Dairy and Food Fermentations	2
FD SC 410	Sensory Evaluation of Food	3
FD SC 600	Seminar in Food Science	1
FD SC 604	Chemistry of Dairy Products	2
FD SC 621	Food Lipids	2
FD SC 622	Nutraceuticals and Functional Foods	2
FD SC 665(6650)	Food and Bioprocessing Systems	2
AEM 442	Emerging Markets	3
AEM 444	Marketing Strategy and Brand Management	3
AEM 446	Food Marketing Colloquium	1
AEM 642	Globalization, Food Safety, and Nutrition	2
IARD 402	International Agriculture and Rural Development	2

Students will continue with their advisor to work on their special project during the fall. They may complete their special project in the fall or may carry it over into the spring semester and finish it in India (communication with faculty advisor would then be through e-mail and webcam). If the students would like to complete their degree for an August conferral they will need to assure that their special project report is approved by their advisor by May 15 at the latest.

Spring semester (students will register “in absentia” at Cornell [1 Cornell RU will be earned in absentia]; students will take at least 6 TNAU credits through courses taught by Cornell faculty at TNAU)

Students will take INTAG 602 (which is crosslisted at TNAU) and enroll into this through TNAU. Students will take at least two 2-week modules offered by CU faculty at TNAU (3 hours per day for 9 days, 1 hour per day for last day); all modules will be cross-listed at Cornell and TNAU and students will enroll through TNAU. Three of the five modules listed below will be offered every spring.

- (1) FD SC 655 Food and Bioprocessing Systems- Rizvi
- (2) FD SC 401 Concepts of Product Development - Hotchkiss
- (3) FD SC 415 Principles of Food Packaging - Hotchkiss
- (4) FD SC 450 Fundamentals of Food Law – Regenstein
- (5) FD SC 456 Advanced Concepts in Sensory Evaluation - Lawless

Students will receive credits for these courses at TNAU, credits will be transferred to Cornell once students receive TNAU transcripts. While students are expected to complete a considerable portion of their special project during their summer and fall at

Cornell, students will complete their special projects and their special project paper at TNAU in the spring; video links are available for consultations with their Ithaca advisors

Students should complete their special project and all requirements by July 15 for MPS degree conferral in August.

### **Main Reasons for Partnership with TNAU**

1. Track record of successful TNAU-Cornell partnership: Cornell and TNAU faculty and students have enjoyed a successful and mutually beneficial partnership over the past three years through the IARD 402 / 602 courses. Team teaching, experiential learning, and short term student and faculty exchange have all been successful aspects of these jointly managed courses.
2. Reputation for high academic quality: TNAU is the highest recipient of external research grants among all the State Agriculture Universities in India and is known for high quality undergraduate and graduate education across a wide range of agriculture-related disciplines, including food science.
3. Support of Senior TNAU Leadership: Over the last decade, TNAU Vice Chancellors have consistently displayed a high level of commitment to the Cornell partnership.
4. Strength in relevant departments: A strong food science department and strong economics group in TNAU will provide opportunities for Cornell faculty to engage in collaborative research programs. TNAU is currently partnering with other leading U.S. Universities such as MSU, UC Davis and Purdue on several research partnerships. The TNAU faculty includes a large number of US Land Grant trained scientists.
5. Potential for external support: TNAU's industry relationships and outreach efforts are unparalleled among Indian universities. This has attracted donor interest to support this proposed partnership. TNAU has successfully demonstrated to global donors such as the Rockefeller Foundation and to national donors such as the Tata Trust their ability to accomplish goals set for development initiatives.
6. Complementary relationships: Cornell partnered successfully with the Government of Tamil Nadu and TNAU to establish the Tamil Nadu Center for Life Sciences (TICEL).

### **Diversity Policies at TNAU**

Like Cornell, TNAU has established a procedure to promote diversity. To carry its commitment TNAU follows the guidelines established by the State of Tamil Nadu to promote diversity. Students from Backward Classes, Scheduled Castes, Scheduled Tribes with minimum qualifying marks of 60 % are given preference. Similarly children of farmers, physically handicapped, sons and daughters of Ex-Servicemen are given preference. Minorities have a fixed number of seats in the admission process.

### **Recruitment Plans (especially those from underrepresented groups, and women):**

TNAU has in place a recruitment plan to select meritorious and under-represented minorities and women. Both Cornell and TNAU will work together to ensure that mutually agreed upon criteria are followed in the selection of students. Each selected student would have adequate instructional support provided at both Cornell and TNAU to

complete their dual degree. Based on our experience with IARD 602, we anticipate that a majority of the most qualified students will be women.

### **Strengths, Interests of Cornell Faculty**

The Ithaca and Geneva Food Science faculties have expressed strong interest in this program as participation will provide an opportunity to develop specific case studies for use in teaching. It also provides exciting opportunities for collaborative research involving both Cornell and TNAU faculty and presents good prospects for joint publications and outreach activities.

### **Availability of Cornell Faculty**

Faculty of the Field of Food Science and Technology has voted in favor of this program. Several faculty members from both Food Science departments (Ithaca and Geneva), the Department of Applied Economics and Management and International Programs/CALS will be assisting with program development and implementation. The proposed courses to be taught and the time line for admission to M.P.S. are listed in Appendix 2.

## **II. Curricular Information**

### *1. How many committee members is a student required to have?*

The student's committee consists of an advisor and a minor committee member from Cornell. Students will also have a M. tech advisor from TNAU, and will closely work with the two program coordinators at Cornell (one based in Food Science and one based in IP/CALS). The advisor at Cornell and TNAU will jointly supervise the student's problem-solving project. The Committee members will be responsible for advising the student in the development of a comprehensive plan of study consistent with the formal requirements of the degree. The committee will also approve and guide the problem-solving project and may appraise the student's progress by means of oral or written examinations. The student must have at least 2 members on his/her Committee by the beginning of the second semester of study. The Cornell advisor will be the final decision maker.

### *2. How many registration units are required for your degree program(s)?*

### **Duration**

The Cornell-TNAU dual degree M.P.S/M.Tech. Program will require two years to complete. Students will register at Cornell for full time study during one regular semester plus one summer. Students will register at TNAU for full time study during three regular semesters. (During one of those TNAU semesters, Cornell and TNAU faculty will jointly teach Cornell courses organized as three-week modules).

### **Degree Requirements**

The Cornell-awarded degree in the proposed dual degree program is a credit-based program requiring 32 credits with 6 of the 32 credits allowed for the student's problem-solving project as stipulated in M.P.S. degree requirements. M.P.S. degree conferral will be based upon successful completion of coursework during a summer and Fall term in residence, plus modularized courses co-taught at TNAU by Cornell faculty members. A

formal project report will be submitted to and approved by the candidate's Special Committee during the final semester. The 32 credits of Cornell coursework will be taken as follows:

- a minimum of 24 credits to be taken at Ithaca campus (summer and fall semester), including 6 credits for the special project under joint supervision of Cornell and TNAU faculty
- 6 credits taken in TNAU for courses offered by Cornell faculty in cooperation with TNAU faculty.
- A minimum grade point average of 2.7 (minimum of 18 credit hours with letter grades at Cornell) will be required.

Additionally, dual degree candidates will take 3 semesters of coursework in TNAU as per the regular M.Tech curriculum.

*3. Will students be scheduling their exams with the Graduate School?*

There is no special exam required for the M.P.S. degree. The project report must be approved by the candidate's Special Committee.

*4. Will students be required to submit a project (circle **yes** or **no**) or a thesis (circle **yes** or **no**)?*

Yes, it counts for 6 credits. A special project requirement allows students to develop a practical project paper that can be useful to other practitioners and is relevant to candidates' future responsibilities. The project may evaluate past work experiences or could be designed as a novel program element for the candidate's current employer. The M.P.S. special project is developed in conjunction with the Student's Committee members. The special project paper must be approved by the Committee.

*5. Will students submit their project or thesis to the field or to the Graduate School?*

Students will submit their project papers to the Field of Food Science and Technology a copy will be placed in Mann Library.

*6. Will a master's degree be awarded to students who pass their A exams and continue on for the Ph.D. (circle **yes** or **no**)?*

No

*7. Will a master's degree be available to a student who was admitted into a Ph.D. program but who will be not continuing on for the Ph.D. (circle **yes** or **no**)?*

No. This program only awards Master's degrees.

*8. Do graduates of your program qualify for professional licensure? (If so, which ones.)*

No

*9. Will the Papers Option be available to Ph.D. candidates? If yes, please describe.*

N.A.

*10. What is the effective beginning date of the proposed curricular change (i.e., the preferred date of first enrollment)? What is the termination date (or review/ renewal date) of this program if applicable?*

Once approved, we intend to enroll the first group of 12 students during the summer semester of 2008. After completion of the fall 2008 semester in Ithaca, students will proceed to TNAU to complete the rest of the program. The program will be reviewed every two years (first review 2010). The initial program is planned for 5 years (2008 - 2012). Renewal will depend on progress made during the first three years. In case of delays in approval program inauguration will be rolled over to the summer of 2009.

*11. How long will currently registered students have to complete a degree under the current structure? (Please consider the needs of students on leave.)*

Currently registered M.P.S. students usually complete their 30-credit requirement in one year.

### **III. Student Enrollment and Funding**

*12. Describe the projected student enrollment over time and **indicate the sources and amounts of funding for those students for the duration of their degree programs.***

*Please address all costs associated with student enrollment (internal and external fellowships, assistantships, stipends, and financial aid) for both domestic and international students. **Note that the Graduate School can not provide fellowships or stipends for new degree programs.***

The proposed enrollment for year 1 (2008) is 12 students; and gradually increasing to 15-17 students in year 5 (2012). Full tuition costs for participation in the summer session and one semester at Cornell University will be paid in full through anticipated funding from the Cornell – Sathguru Foundation for Development. The Cornell – Sathguru Foundation for Development has earlier supported joint initiatives of Cornell University with Tamil Nadu Agricultural University, including the INTAG 402 and INTAG 602 courses. Cornell – Sathguru Foundation for Development derives funding support from industry and philanthropic trusts such as the Sir Ratan Tata Trust. See Appendix 3 for details of budget.

### **IV. Program Format**

*13. If your proposal requires a change in format or delivery mode (e.g., distance learning), describe the availability of relevant courses, faculty, resources, and support services (including technical support) and address all questions related to registration, tuition and funding, and graduation.*

M.P.S. (A.L.S.) in Food Science and Technology is an already approved degree in the Field of Food Science and Technology.

The only significant change would be that Food Science faculty (around 3) will offer a three week module at TNAU to meet the M.P.S. requirements (6-8 credits).

Foundation support will cover costs associated with deploying Cornell faculty to India to co-teach these three week modules.

*14. If your proposal is based, even in part, on distance learning technologies, please describe those and indicate the percentage of instruction that will be delivered through those technologies.*

We will be leveraging our existing distance learning (video conferencing), which is used for students enrolled in IARD 402/602 (5 credits). Currently the IARD 402 and 602 courses are delivered connecting TNAU through the video link. The director of the Transnational Learning Program in CALS is intensively engaged in supporting TNAU to enhance their ability to access digital learning modules and archive them. At the Cornell end, visiting faculty and all the students will be provided access to appropriate infrastructure. As this is an on-going effort no new facilities are planned for this program.

*15. If your proposal involves a change of (instruction) location, specify that location and describe the availability of relevant courses, faculty, resources, and support services and address all questions related to registration, tuition and funding, and graduation*

A total of 6 credits will be offered in India at TNAU by Food Science faculty at Cornell. The travel cost and per diem for Cornell faculty will be borne by Indian partners. TNAU has agreed to provide support for all logistical help with accommodations, secretarial support and any other specific need. (See section above on budget).

*16. If your proposal involves a change in the program calendar -- from, say, two academic years to one calendar year -- describe that change in detail (including availability of relevant courses, faculty, resources, support services, and all questions related to registration, tuition and funding, and graduation). Demonstrate that the program remains sound in terms of content as well as structure (i.e., minimum number of contact hours; required number of credits, courses, and registration units; availability of faculty, staff, and support services). Address the special needs of international students re: obtaining visas and compliance with all immigration regulations. Address the resolution of grievances that might arise if, for example, a student can not meet the degree requirements in the allotted time because of program design.*

M.P.S. students will take a total of 24 credits at Cornell (Summer and Fall sessions). The remaining 6 credits will be taken at TNAU through courses to be taught by Cornell food science faculty in cooperation with TNAU faculty. The program has been designed not to simply “remain sound” but to offer exceptional new learning opportunities not found on either of the partner campuses alone.

IP/CALS staff possesses significant experience in working on all aspects of transnational academic programs. Staff resources are already in place to fully meet the special needs of international students, i.e. obtaining visas, compliance with immigration regulations, assisting incoming international students with housing, orientation, and the overall “settling in” process.

*17. If you are proposing either a joint or dual degree option, additional information will be needed and registration with the State Education Department will be required. Middle States review is required for off site programs. An MOU will be required for inter- institutional programs. Please contact the Graduate School for further information and forms.*

Additional information can be made available. Please note that there is also an MOU between CALS and TNAU for research, teaching and extension.

## **V. Staffing and Operations**

18. *Does your field faculty have endowed appointments only, contract college appointments only, or both? Will the field membership change as a result of this proposal? (If so, describe.)*

The field has contract college and a limited number of endowed appointments (two faculty). The field membership will not change.

19. *Will any faculty need to make changes to their concentrations and areas of research as recorded on their faculty cards? (If yes, faculty cards on file with the Graduate School will need to be updated.)*

No.

20. *Comment on the need for additional staff, space and/or financial resources relevant to the implementation of your proposal and describe how you will meet those needs.*

Financial support to cover full tuition and living expenses for participation in summer and fall semester will be provided by the Cornell–Sathguru Foundation, which derives financial support from industry donors and philanthropic organizations such as the Sir Ratan Tata Trust in India. The Foundation will pay all expenses in U.S. dollars to Cornell towards the student tuition and Cornell faculty travel expenses to cover costs of teaching in TNAU. The foundation will also provide partial support for staff in Food Science and IP/CALS, which will assist with this program. For details see budget section

## **VI. Institutional Concerns**

21. *Comment on the University's institutional need for this change in, or addition to, the graduate curriculum.*

1. The project will promote sustained interactions with a leading Indian university. Cornell's Food Science curricula will be enhanced in ways that position our graduates for public and private sector leadership in the global food industry.
2. Collaboration will have bi-national relevance. The case studies and faculty exchange will lead to collaboration in research to address important agricultural needs of India and U.S.;
3. Distance education will be leveraged to support collaborative curriculum development work and teaching. It is anticipated that through the use of distance learning technology some of the benefits of this academic partnership can be extended to other Cornell students.
4. The inclusion of transnational experiential learning will enhance the demand for graduates in the rapidly growing global food industry.

Cornell students not enrolled in the dual degree program will have the opportunity to enroll in Cornell taught courses at TNAU.

22. *Describe the positive effects of this change on other fields or Cornell faculty.*

Case studies developed will internationalize curriculum in the Food Science Department. Cornell faculty will have an opportunity to work with top Indian food scientists, to network with Asian industry leaders, and to teach a cohort of competitively selected students destined for leadership in a rapidly evolving food industry. Cornell students will gain substantially as they will be sensitized to global needs in the food science sector. Other departments such as AEM, Plant Breeding and Genetics, Plant Pathology,

Entomology, International Agriculture and Rural Development (IARD) may be able to use the connections to develop their own collaborative research projects. This will be a win-win for both Cornell and TNAU.

*23. Address the negative effects, if any, of this change on other fields or Cornell faculty and explain how those effects will be mitigated.*

Four to six credits will be taught in India by relevant Cornell food science faculty. Scheduling, though difficult, will be managed. Faculty will be teaching during the winter break (January) so that their regular teaching is not affected.

*24. In the event that your proposal does not receive approval, how else might you accomplish the goals it represents?*

There is competition for the same program from Michigan State University; UC-Davis and Purdue. If the proposed dual degree program at Cornell is not approved, one of these universities most likely will take our place.

## **VII. Attachments**

*25. Include the results of a faculty vote and address the results including the thinking behind negative votes or abstentions (if applicable).*

The field faculty in Food Science and Technology was polled on the dual degree program with TNAU. Among the 27 respondents, 19 supported the idea, 6 were neutral, and 2 did not support the program. Faculty concerns raised by those not supporting the program predominantly evolved around the issue of program funding, e.g., concerns as to who would pay for student tuition and for faculty travel to India. Apparently we did not make it clear that this initiative includes full financial support, including for student tuition and for faculty travel to India.

*26. Attach a sample multi-year curriculum and schedule of courses for the typical student enrolled in this program. Include evidence that minimum State requirements are met re: contact hours, credits, etc., if applicable.*

See Appendix 2.

*27. Provide a list of currently offered courses that support this program. List and describe new academic courses for which you will seek approval, if applicable.*

See Appendix 2. No new academic courses are proposed for this program.

*28. Attach a current and a revised FIELD/Subject and concentration list if applicable.*

Current subject concentrations are Food Chemistry, Food Microbiology, Food Engineering, Food Waste Management, International Food Science, Enology, Dairy Science, Sensory Science, and General Food Science.

*29. Attach copy text for eventual publication on the graduate school website and on-line application.*

The draft provided below will be modified after approval of M.P.S. dual degree option:

Cornell University and partners in India propose to establish a project that will significantly enhance the capacity of Tamil Nadu Agricultural University, in India to

deliver world-class education to Indian students. The project aims to develop a dual degree M.P.S. (Master of Professional Studies) program to be offered in Cornell and TNAU in India in the following fields:

1. Master of Professional Studies (M.P.S) (A.L.S) in Food Science and Technology
2. M.Tech in Food & Agricultural Process Engineering (TNAU)

The focus of the program is on post-harvest and food processing technologies. The post-harvest and process technologies will help to minimize the wastage and value addition opportunities. Presently, Indian agricultural universities do not offer world-class education in this frontier area of critical knowledge, and trained faculty is in short supply. The goal of the program is to build leadership and strong capacity between Cornell and TNAU to deliver quality education at the post-graduate level.

In the first year, the proposed M.P.S. program will supplement course content for training a total of 12 Indian students from TNAU. These graduates will be the first batch of internationally exposed graduates with comprehensive capability to meet the needs of the private and public sectors as well as non-governmental organizations in India.

A Cornell M.P.S. degree in this proposed field will produce a student with comprehensive capability. A needs assessment has been done in the past, and more recently in January 2007, on curriculum development in emerging areas of agriculture and rural development by Cornell-Sathguru in collaboration with the Indian Council for Agricultural Research (ICAR) and other U.S. Land Grant institutions. In the area of food processing (Value addition and markets) it is observed with concern, that only 2 percent of the total produce in India is processed, which leaves a tremendous scope and opportunity in the area of food processing and marketing. Fruits and vegetables incur a 30-40 percent loss, which increases the cost of production and hence reduces competitiveness. The recent market reforms in India are encouraging and represent a first step toward global competitiveness (the ability of India to retain its own markets). Therefore, to match the global requirements, it is imperative to customize the curriculum in agricultural education to address needs of local and international industry and markets. The proposed M.P.S. and M.Tech dual degree option in this area, focusing on food science, engineering and management aspects, will generate a pool of Indian & Cornell students who will be well equipped to serve the growing food industry. There will be opportunities for both Cornell and TNAU students to work together on research and project papers.

The program draws upon several years of Cornell engagement in partnership with Sathguru Management Consultants through Cornell-Sathguru Foundation for Development to support State Agricultural Universities (SAUs) and the National Agricultural Research System in building capacity for agricultural research and rural development. In particular, the programs draws immensely upon the experience gained in delivering International Agriculture and Rural Development (IARD) 402 & 602 course over the last five years, with recent years' courses supported by the Tata Trusts. Course participants supported by Tata Trusts will be referred to as "Tata Fellows." The dual degree program will provide opportunity for TNAU and Cornell to deliver the dual

degree courses that would match to the standard of courses delivered by Cornell University at the Ithaca campus. This will be accomplished by a collaborative partnership that will involve faculty and experts among the partners working together to shape a world-class curriculum, and adopt teaching methods and techniques that will provide experiential learning opportunity to the students. Cornell faculty would supervise course development and delivery supported locally by Indian faculty. The intensive engagement of resource persons from India and USA during the initial two years will provide comprehensive permanent capacity within TNAU to deliver high quality research driven education, matching Cornell standards. In the process TNAU will enhance their comprehensive capacity in the area of library management with digitized resources, and develop case studies for experiential learning and research management expertise. The gains to National Agricultural Research System through this education program will be immense.

Advertisement of this program will occur through the TNAU and Cornell Food science WWW pages as well as through a press release and short announcements in food science journals (e.g., *Food technology*) and appropriate e-mail lists (e.g. FSNet, which is a worldwide mailing list on food science related issues)

*30. Attach support letters from your college dean and other relevant academic and administrative staff.*

See Appendix 4.

*32. (For new major fields, new degree programs, or new academic initiatives): Provide the names and addresses of three [non-Cornell] professors who could serve as potential external reviewers if this is required by Albany.*

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*33. For programs with international institutions, provide as addenda: an accounting of the decision-making process which justifies your choice of partner institution; an indication of “equity of participation” at the institution in question; and a detailed account of the financial arrangements that underpin your proposal. See the grad school’s Dual and Joint Degree Memorandum of 11/20/2007, numbers 5, 6, and 7. This is addressed in detail in above sections.*