Professional Leave Report Cover Sheet

Name: Nitaigour Mahalik

Department: Industrial Technology

College: Jordan College of Ag Sciences & Technology

Leave taken: x Sabbatical Difference in Pay Professional Leave without Pay

Time Period: Fall

x Spring

Academic Year

Other

Please upload your report to this DocuSign envelope. Your report will be sent to your Dean for your PAF and to the Library Archives. You will also receive a confirmation copy.

MEMORANDUM

DATE: September 21, 2021

TO: Dr. Xuanning Fu, Ph.D.
Interim Provost and Vice President for Academic Affairs.
California State University, Fresno
(Through Office of the Faculty Affairs by email attachment)

Dr. Dennis Nef, Dean
College of Agricultural Sciences & Technology

FROM: Dr. Nitaigour Mahalik, Professor
Department of Industrial Technology

RE: **Post Sabbatical Leave Report**

I was approved one semester of sabbatical leave during the fall 2020. Due to COVID-19 pandemic, I had requested the Dean to move the sabbatical leave from fall 2020 to Spring 2021. It was approved (See Attachment 2).

I successfully completed the sabbatical engagement and accomplished the goals and objectives that I had cited in my proposal. I completed the sabbatical when COVID-19 pandemic was at the peak. I utilized the sabbatical leave to enhance my professional experience leading to a greater command of subject matter in the areas of Safety and Industry 4.0. I believe that I have brought more experience for both teaching and research in the applied areas of Safety and Industry 4.0 through the outcome of this professional leave. As a requirement, I have attached the post sabbatical leave report (See Attachment 1) along with my original proposal in this memo (Please see Attachment 3).

Sincerely,

Nitaigour Mahalik

Attachments:
1. Post-sabbatical Leave Report (4 pages)
2. Communication/approval on sabbatical change from Fall 2020 to Spring 2021 (3 documents; 3 pages).
3. Copy of my sabbatical Memo & Proposal (2 documents; 20 pages)

Attachment 1

Post-Sabbatical Report (4 pages)

Post-Sabbatical Leave Report
(Sabbatical Leave in Spring 2021; Report Submitted on 09.2[illegible]2021)
Faculty Name: Nitaigour Prem Mahalik
Department: Department of Industrial Technology

Preamble:

I accomplished the goals and objectives that I had proposed in my sabbatical proposal, and completed them all in spring 2021, during a period when the COVID-19 pandemic was at its peak. I utilized the sabbatical leave for studies leading to a greater command of subject matter and to accomplish a shift in areas of academic emphasis such as Safety and Industry 4.0. Using this professional leave, I believe that I have brought more experience for both teaching and research in the applied areas of Safety and Industry 4.0. As per APM 360 and 361, a professional leave must be followed by a report of the leave activities. This is my post sabbatical report (Attachment 1). I have also included the original proposal as Attachment 3, as needed.

a) Accomplishments of the leave in relation to the goals of the original proposal:

My sabbatical leave goal was to acquire greater command of subject matter in the interdisciplinary areas of Safety and Industry 4.0, and then integrate the currency in my teaching and research in future. The overall focus was to explore, study, and gain knowledge on how multidisciplinary science, engineering and technology are blended in relation to Safety and Industry 4.0. I successfully completed the sabbatical leave and accomplished the goal and objectives that I had set in my original proposal. To achieve the goals, I had proposed objective-activities (OA) and subsequently completed those. The activities were to interact and engage myself with the industries, companies, research centers, organizations, and R&D facilities through meetings, tours, and visits. Due to COVID-19 pandemic, I had to complete some of the activities in virtual modes as there were mandatory travel restrictions and shelter-in-place like situations. I used Websites and Internet links for virtual visits, and Zoom, WhatsApp, and Google Meet platform for synchronous meetings. My professional interactions and engagements were with the stakeholders, researchers, directors, partners, colleagues, and experts who were from the organizations, institutes, and centers.

I am providing some examples of my activities and brief description on how these enhanced my professional experience leading to a greater command of subject matter in the areas of Safety and Industry 4.0. I made in-person tours to ADCO Manufacturing and Sinclair companies. Both the industries give priority to Process Safety Management (PSM), a regulation enforced by OSHA (Occupational Safety and Health Administration). The ADCO Manufacturing plant, in fact, maintains *quality of safety* from design to manufacturing (machines and parts) stage. The Sinclair company not only takes care of safety seriously at the factory site but also for the environment because one of the byproducts they get during the process is a toxic chemical compound. The use of safety regulation for chemicals starting from its usage to storage of byproducts and its disposal is not only a challenge but also a trade-off.

I had made in-person visits to six industries. From all the industries, I gained professional experience in regard to (a) knowledge-based Safety Management and Decision Support Systems; (b) novel Safety and Industry 4.0 strategies; (c) new Industry 4.0 standards for waste reduction;

(d) technologies for effective management and optimization; (e) risk management in recycling, reuse, and sustainable procedures; and (f) adaptation of ideas to face challenges and provide solutions as regards to Safety and Industry 4.0.

The virtual tours and visits to R&D institutes, organizations, centers, and departments were a boost to my future scholarly and research activities. Out of many industry, company, institute, and center sites that I visited and explored, I am only citing a few of them here. They are Department of Labor, CAL OSHA, HSI, CREATE Energy Center, just to name a few. I extensively visited the laboratory and plant space virtually. I also discussed with the experts at their end when I had questions and wanted more information.

My proposal included an international trip to two national organizations and some state facilities in the state of Odisha in India; They are Krishi Vigyan Kendra (KVK), Industrial Training Institute, Berhampur (ITIB), horticulture farm, OUAT, and tissue culture laboratory. As the COVID-19 pandemic was severe in India during March/April 2021, it was not possible to arrange international travel. So, I facilitated virtual synchronous meetings with the personnel at KVK, ITIB, OUAT, and so on. My virtual training at IITB was worthwhile, and I was able to study Safety and Industry 4.0 principles from machine design prospective. Also, I had discussions with several other organizations such as Indian Air Force, PRIYA, DRIEMS who follow Safety and Industry 4.0 guidelines and standards holistically. Through my interactions with organizations, industries, institutes, centers, and departments, I gained a great deal of knowledge by exploring their infrastructure, facilities, resources, and scope of research and outreach. The professional interactions and meetings (in-person and virtual) enabled me to learn about multidisciplinary areas and learn about exchange programs and community relations from a global perspective. All these were achieved via multiple phone calls, emails, Zoom, WhatsApp and Google meetings.

It was eye-opening to real world practices, management, and operation regarding Safety and Industry 4.0. Safety and Industry 4.0 principles and practices will help enhance the scope of my teaching and research in future. I strongly believe that I brought more experience for both teaching and research in the applied areas. It was my interest to effectively use the leave with the stated goals in mind. I spent good amount of time in visiting and touring industries followed by doing analysis on how science, engineering, and technology are being used to implement Safety and Industry 4.0 in the processes, production, machineries, planning, management and logistics. I now also possess more knowledge about how the industries and companies handle memberships with partnering companies, research grants, internship and paid project work, the underlying principle and integration methods, the designs, control systems and instrumentation, computer software and management, machine interfaces, and technology trends, industry-institute interactions, training to customers, various organizational structure and hierarchy in staffing and professionals, the organizational links with the professional societies and benefits, research and development, start-up time, achievements, plans, and trends, and stories in relation to Safety and Industry 4.0. The outcome of my sabbatical engagement has enhanced my professional experience in that I have now greater command of subject matter in the areas of Safety and Industry 4.0. Because of the tour and visits, I have now established more industry and academic links which will provide me opportunities in building community engagement while integrating Safety and Industry 4.0 areas. In summary, I accomplished the following.

(a) studied the Safety and Industry 4.0 standards and currency,
(b) did scientific and technical analysis as regards to systems and machineries,
(c) prepared a blueprint for how the knowledge can be utilized for classroom teaching and applied research,
(d) updated the currency to pursue scholarly activities and listed the review items required to write and submit the grant proposal to funding agency in future,
(a) enhanced the opportunity for international collaboration in the field of Safety and Industry 4.0 and exchange possibilities, and
(b) gained knowledge on sustainability in Safety and Industry 4.0

b) Modifications, if any, to the original proposal, and the circumstances that necessitated these modifications:

I was approved one semester of sabbatical leave during the fall 2020. Due to COVID-19 pandemic, I had requested the Dean to move the sabbatical leave from fall 2020 to Spring 2021 assuming that the pandemic situation would be better in spring 2021. My request was duly approved by the Dean (See Attachment 2). I had proposed tours and visits to industries, companies, and centers. Because of COVID-19 pandemic, some industries and organizations denied physical tours. On the other hand, they allowed virtual tours and provided me abundance of materials and information on Safety and Industry 4.0. At the same time, as some industries and companies allowed in-person tours, I was able to visit them (six industries) following their local COVID-19 rules and procedures.

c) The objectives of the original proposal (if any) that were not accomplished:

Not applicable

d) Anticipated outcomes for the near future as a consequence of the leave's activities:

I visited industries and research centers both virtually and in-person whichever was possible due to COVID-19 situation with an objective to gain knowledge and subsequently analyze about how science, engineering, and technology have been utilized in the processes, production, machineries, planning, management, logistics, and communications. I am satisfied that I acquire greater command in the topical subjects Safety and Industry 4.0 and beyond (Note: I am using the word *beyond* here due to the reason that there has been some insights on Industry 5.0, although Industry 4.0 is the status quo, will sustain, and overlaps with 5.0. It also includes Agriculture 4.0) within Industrial Technology and Agricultural Systems Management (IT/ASM) disciplines. Through objective-activities (OAs), I gained the developmental experience that took me to a point where I now have greater command of subject matter in the areas of recent advances in Industrial Technology (IT) that our new curriculum is embedded with (shift). The interdisciplinary experience thus gained can augment the academic enhancement and increase the capability, capacity, and links in the department of Industrial Technology (IT) for the purpose of future engagement (teaching and research) and community service activities that will continue to function. The experience provided me currency of Safety and Industry 4.0 as well as in other

broader areas such as advanced manufacturing, production systems, assembly lines, automation and control, instrumentation, technology and society, data processing, and machineries.

The knowledge thus gained will facilitate the embodiment of the department to the body of JCAST. Eventually, it will solidify the JCAST goal to integration of academic program into research unit. Clearly there are benefits to the department in terms of teaching and sustained research opportunities. I can now critically think about the next step of pursuing scholarly activities in the advanced areas of Safety and Industry 4.0 considering processing, packaging, automation, instrumentation, design and development, computing, and control, and engage the students in research and project activities. Advanced Automation that includes Safety and Industry 4.0 is important subjects in the field of Industrial Technology. As critical as they are, the department of Industrial Technology has had limited capacity building resources. I am now ready to fill the gap and develop expertise in Safety and Industry 4.0. Personally, the outcome of the sabbatical leave will enable me to help improve several courses in the department of Industrial Technology such as Technology and Society (IT 20), Exploring Technology Systems (IT 30), Electricity and Electronics (IT 52), Safety Management (IT92), Industrial Process Control Systems I and II (IT 112 and IT 133), Automated Systems I (131), Research Methods (IT 280), Independent Studies (IT 290), Projects (IT 199 and IT 298). To begin with, I will start enhancing the contents of the course IT 52 and IT 92 in coming semesters. I will include several learning activities in this potential field. The course improvements will ultimately help the department in such areas as applied research, student internships, employment, and extracurricular activities. Also, the anticipated outcome for the near future will enable me to list the review items required to write and submit the grant proposals to the funding agency. The sabbatical has enhanced global connection and established opportunity for collaboration as well. Benefits of this sabbatical leave to the university are also far reaching. Learning how industry use scientific principle and technical designs can help me be a better teacher, researcher, and administrator.

Attachment 2

Communication/approval on sabbatical change from Fall 2020 to Spring 2021 (3 documents; 3 pages)

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FRESNO STATE
Jordan College of Agricultural Sciences and Technology

MEMORANDUM

Date: November 22, 2019

To: Dr. Nitaigour Mahalik
Department of Industrial Technology

From: Dr. Scott Williamson
Chair of the Jordan College of Agricultural Sciences and Technology Professional Leave Committee

Re: **Sabbatical Leave**

The Jordan College Professional Leave Committee met on November 21, 2019 to review sabbatical leave requests for the college. The leave requests were reviewed in accordance with Academic Policy Manual 360 Poly on Sabbaticals and Difference-In-Pay Leaves.

We have ranked your sabbatical proposal 3rd out of 4 and provided the comments below to Dean Nef:

3rd - **Dr. Nitaigour Mahalik,** Department of Industrial Technology
- Improves departmental curricula, specifically safety instruction;
- Provided a detailed report of previous sabbatical leave;
- Advances the recognition of the university; and
- Proposed activities can be completed in the time period requested.

Thank you for your continued service and dedication to the College.

Cc: Dr. Alex Alexandrou, Chair, Department of Industrial Technology
Dr. Dennis Nef, Dean

Office of the Dean
California State University, Fresno • Agricultural Sciences Building, Room 102
2415 East San Ramon Avenue M/S AS 79 • Fresno, California 93740-8033

P 559.278.2061 **F** 559.278.4496 ***http://jcast.csufresno.edu/*** THE CALIFORNIA STATE UNIVERSITY

FRESNO STATE

Nitaigour Premchand Mahalik, Professor <nmahalik@mail.fresnostate.edu>

Request to the Dean to move my Sabbatical from Fall 2020 to Spring 2021

1 message

Dr. Nitaigour Premchand Mahalik, Professor <nmahalik@csufresno.edu> Thu, Apr 23, 2020 at 7:29 PM
To: "Lopez, Linda" <lindaa@csufresno.edu>
Cc: Marsha Baum <baum@csufresno.edu>

Hi Linda,

I am wondering if Dean Nef would allow me to move my approved Sabbatical Leave (SL) from Fall 2020 to Spring 2021. Please note that my SL proposal includes Industry and International visits. Given the extenuating circumstances, I think that Spring 2021 could be a better time. Would you please communicate with Dean Nef and let me know if moving to Spring 2021 is possible? Accordingly, I would have to inform the Department not to assign me courses in Spring 2021, and schedule in Fall 2020 instead.

Best regards.

Prem
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Dr. Nitaigour Premchand Mahalik
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Room IT 210, Grosse Industrial Technology Building, M/S IT9,
Department of Industrial Technology
Jordan College of Agricultural Sciences and Technology
California State University, Fresno, CA 93740,
USA
Phone: (559) 278-2995

FRESNO STATE
Jordan College of Agricultural Sciences and Technology

MEMORANDUM

DATE: May 14, 2020

TO: Nitaigour Mahalik, Professor
Department of Industrial Technology

FROM: Dennis Nef
Dean

DocuSigned by:
Dr. Dennis Nef
2449F964D4B0406...

SUBJECT: Sabbatical Change Request

I am in receipt of your email request to change your sabbatical leave from Fall 2020 to Spring 2021. I have carefully reviewed your request and consulted with your department chair on the operational needs of the department and your request is approved. Be advised however, that the course schedule for Fall 2020 has already been set. You may be asked to teach supervisory courses to complete your teaching load.

Thank you.

DN/lla

Copy: N. Mahalik PAF
A. Alexandrou, Department Chair
M. Baum, AVP Faculty Affairs
S. Jimenez-Sandoval, Provost

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Attachment 3

Copy of my sabbatical Memo & Proposal

(2 documents; 20 pages)

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MEMORANDUM

DATE: October 9, 2019

TO: Denis Nef, Dean
Michael Thomas, Associate Dean
Jordan College of Agricultural Sciences & Technology

CC: Saúl Jiménez-Sandoval, Provost, Fresno State

FROM: Nitaigour Prem Mahalik, PhD
Department of Industrial Technology

RE: **Sabbatical Leave application for Fall 2020**

I am requesting one semester of sabbatical leave at full pay during Fall 2020. I am interested to utilize the sabbatical leave for my developmental needs and long-standing benefits at Fresno State. Also, the purpose of utilizing the sabbatical leave is to provide benefits to the University/College and the Department. For developmental needs and benefits, I have listed objective-activities (OA) that I will accomplish during the sabbatical leave in Fall 2020.

Through objective-activities (OA), I will gain the experience that will take me to a point where I can have a greater command of subject matter in the areas of recent advances in Industrial Technology (IT) that our new curriculum is embedded with. In particular, my developmental focus will be on Safety and Industry 4.0 and beyond (Note: I am using the word *beyond* here due to the reason that there has been some insights on Industry 5.0, although Industry 4.0 is the status quo, will sustain, and it overlaps with 5.0. It also includes Agriculture 4.0) within Industrial Technology and Agricultural Systems Management (IT/ASM) disciplines.

At this point, I am to say that broadly, my teachings cover the scientific and technical aspects of the IT Major/discipline, and as such I have been teaching courses that reflect core areas of a traditional IT Major/discipline. Since our updated IT Major/discipline and the brand-new ASM Option have “Multidisciplinary and Management” blends, as a senior tenured faculty member in the IT Department, I feel that developmental needs is a must for my instructional improvement for future teaching of the new and modified courses in the IT Department. The experience that I will gain through sabbatical will facilitate the embodiment of the IT Department to the body of JCAST. The prime benefits to the IT Department are sustained teaching and research opportunities; enhanced presence regionally and internationally; and expanded career market for graduates and enlarged recruitment platform. These benefits will solidify the JCAST goal to integrate our new programs and curriculum into academic units in terms of student retention and success, external relations, and efficient operations, respectively. Benefits of this sabbatical leave to the University and College are thus far reaching.

Safety and Industry 4.0 and beyond are important, advanced, and contextual topics in IT/ASM discipline. As critical as they are the IT Department has been trying to upgrade the courses for its new curriculum. I plan to engage myself in making multiple tours, visits and trips to the industries, companies, research centers, institutes, and organizations and explore how multidiscipline and management have thematically been blended in the real-world IT/ASM Disciplines/Systems, and then synthesize them for integration into my teachings (curriculum) in Spring 2021 and afterwards. I will take advantage of this engagement opportunities to formulate pedagogy, strategically.

The tours, visits, and trips followed by synthesis and pedagogical context-building will enable me to update the currency of applied technology and critically think about the next step of pursuing scholarly activities in the advanced areas of Safety and Industry 4.0 and beyond within IT/ASM discipline. I will be able to engage IT and JCAST students in the advanced and demanding areas of IT/ASM discipline at Fresno State, boldly. Also, the outcome of this sabbatical will enable me to list the review items required to write and submit grant proposals to the funding agency at Fresno State in future. Personally, this sabbatical leave will help me to improve the following courses within the curriculum: Technology and Society (IT 20), Exploring Technology Systems (IT 30), Electricity and Electronics (IT 52), Safety Management (IT 92), Industrial Process Control Systems (IT 112), Automated Systems I (IT 131), Research Methods (IT 280), and Technical Writing (IT198w), Senior Problems (IT 199), IT 190 (Independent Study), IT 191T (Topics in Industrial Technology), IT 194I (Cooperative Education in Industrial Technology), Independent Study (IT 290), Graduate Projects/Thesis (IT 298/IT 299), etc. The improvements in the courses will ultimately help IT Department in the following areas: recruitment, internship, student club operation, applied research, student internships, student success, community relations, employment and extracurricular activities.

This sabbatical leave request is the first time that I am requesting to Fresno State after my promotion application for full Professor in 2014, and in the meanwhile, there have been several revamps into the departmental curriculum.

Thanking you.

Sabbatical Leave Proposal/Application

For Fall 2020

by
Nitaigour Prem Mahalik, Ph.D.
(Professor)

Department of Industrial Technology
Jordan College of Agricultural Sciences and Technology
California State University, Fresno

October 9, 2019

Table of Contents

Introduction

I am eligible for sabbatical leave as per communication received from the Dean in Fall 2018 and Fall 2019. Please see Appendix D.

My sabbatical leave proposal/application has four main sections: (1) Description on Goals and Activities and Methodology, (2) Benefits to me, (3) Benefits to Department and College/University, and (4) a Detailed Timeline along with the Appendices. Appendices A-C list the addresses of the industries, centers, organizations, respectively; Appendix D contains communications received from the Dean about my sabbatical-leave eligibility.

Section 1: Goals, Activities and Methodology

I am requesting one semester of sabbatical leave for my developmental needs and long-standing benefits at Fresno State. During sabbatical, I will acquire greater command in the topical subjects Safety and Industry 4.0 and beyond (Note: I am using the word *beyond* here due to the reason that there has been some insights on Industry 5.0, although Industry 4.0 is the status quo, will sustain, and it overlaps with 5.0. It also includes Agriculture 4.0) within Industrial Technology and Agricultural Systems Management (IT/ASM) disciplines. I will be able to bring more experience for both teaching and research in the applied areas of technology in agriculture and food. Through objective-activities (OAs), I will gain the developmental experience that will take me to a point where I can have greater command of subject matter in the areas of recent advances in Industrial Technology (IT) that our new curriculum is embedded with.

At various forums, our department advisory board, potential community members, donors, and stakeholders had advised our department and faculty to revamp the curriculum taking into account of current industry needs. Our department has a clear mission, which makes it unique in the Jordan College of Agricultural Sciences and Technology (JCAST) and in the entire state. IT-JCAST integration was put into place. The IT Department has extensively reviewed, updated and developed new curriculum by eliminating and consolidating outdated courses and emphases followed by adding new options and specialties as appropriate, based on the needs. The works remain are that the development of internal building blocks of the new curriculum not only to maintain the currency within the individual course delivery but also to meet the effectiveness of the curricular requirements that truly will meet the needs of the industry and community.

One method of implementing the improved program curriculum through existing faculty members is to provide on the job training experience in the demanding areas. This sabbatical leave is meant for my developmental needs and long-standing benefits as I will be able to gain holistic knowledge-base in the chosen fields and subjects as mentioned above for the greater interest of the College/University. As a faculty, I would like to take advantage of sabbatical leave to update my professional experience and subsequently integrate it with the curriculum that will meet the department and college goals. During sabbatical leave, I will perform objective-activities (OAs) in terms of onsite tours, visits, and trips with the local, national, and international industries, companies and organizations that are specialized in Safety and Industry

4.0 and beyond with a goal to upgrade the applied knowledge-base in transdisciplinary amidst specialty area of IT/ASM discipline. It is my interest to use sabbatical leave effectively and efficiently with the following objective-activities in mind. Table 1 below spells out the activity plan which includes methodology, procedure and follow up.

- *Sabbatical Leave Objective Activity 1 (OA1):* Multiple onsite tours to regional industries and companies who are involved in Safety and Industry 4.0 and beyond.
- *Sabbatical Leave Objective Activity 2 (OA2):* Visiting to at least two research centers/units who are involved in Safety and Industry 4.0 and beyond.
- *Sabbatical Leave Objective Activity 3 (OA3):* Trip to an international institutes of repute who are involved in Safety and Industry 4.0 and beyond.
- Sabbatical Leave Objective Activity 4 (AO4): Conference calls, webinars, online site visits to stakeholders who are involved in Safety and Industry 4.0 and beyond.

Table 1: Details on objective-activities (OA), methodology, and associated outcomes

	Objective Activities	Methodology, procedure, and follow up (based on the activity outcomes)
1.	Tours (OA1)	(a) Tour to multiple agricultural and food production industries; (b) Observe the Safety and Industry 4.0 and beyond which include standards, tools, techniques, methods, approaches, implementations, benefits, and so on within Industrial Technology and Agricultural Systems Management (IT/ASM) disciplines. [Intended courses but not limited to: Electricity and Electronics (IT 52 and MEAG 53), Safety Management (IT92), Industrial Process Control Systems (IT 112), Automated Systems I (IT 131)]; (c) Do technical analysis and prepare a blue-print for how the knowledge can be utilized for classroom teaching and applied research based on the developmental experience gained; (d) Synthesize to embed the knowledge-base in the courses and reflect them in the syllabus to be used in the Spring 2021 semester and thereafter.
2.	Visits (OA2)	(a) Visiting of two renowned agricultural and food production research centers to observe scholarly activities in the field/subjects of Safety and Industry 4.0 and beyond within Industrial Technology and Agricultural Systems Management (IT/ASM) disciplines. [Intended courses, but not limited to: Research Methods (IT 280), and Technical Writing (IT 198w), Senior Problems (IT 199), Independent Studies (IT190/290), Graduate Projects/Thesis (IT 298/IT 299)]; (b) Update the currency; (c) Critically think about the next step to pursue scholarly activities in the demanding field for IT and JCAST students at Fresno State; (d) List the review items required to write and submit the grant proposal to funding agency after the leave; (e) Synthesize to embed the gained developmental experience ingredients in the S & relevant courses in Spring 2021 and after.
3.	Trip (OA3)	(a) Visiting of a large agricultural organization/department and its facilities; (b) Enhance opportunities for collaboration and community relations in the areas of Safety and Industry 4.0 and beyond within Industrial Technology and Agricultural Systems Management (IT/ASM)

		disciplines. [Intended courses but not limited to: Technology and Society (IT 20), Exploring Technology Systems (IT 30), Cooperative Education in Industrial Technology (IT 194I), Independent Studies (IT 190/IT 290)]; (c)Consolidate takeaways on Safety and Industry 4.0 and beyond on national and global point of view; (d) Learn about multidisciplinary areas, diversity, sustainability and management (waste-to-energy), etc.; (e) Learn how to facilitate faculty and student exchange programs in the above field; (f) Synthesize to embed the gained developmental knowledge in the relevant courses in Spring 2021 and after.
4	Online activity (OA4)	(a) Schedule and make conference calls to industries, centers, companies, stakeholders and get relevant information on Safety and Industry 4.0 and beyond (including Agriculture 4.0). (b) Visit websites of academic organizations, research units, organizations and industries who are working and involved in Safety and Industry 4.0/Agriculture 4.0 activities. (c) Review articles, watch academic and educational videos, communicate with stakeholders online remotely to gather relevant information for academic usage. (d) Organize and prepare blueprint for teaching and scholarly activities.

I have chosen several technology-centered agricultural and food production industries to perform the above objective-activities. There are many agricultural and food production industries, companies, units, centers and institutes in the region, state, nation and globe. As regards to multidiscipline and management knowledge-base, some of these companies, industries, centers, units, etc. focus on specific aspects such as distribution and supply chain, some develop and transfer and manage the technologies, and some do research and so on in the areas of Safety and Industry 4.0 and beyond within IT/ASM discipline.

For my tours (OA1), I have chosen small, medium and large scale industries from different categories within agricultural and food production industries such as fruit, meat, beverages, machinery, software, tools, production, and so on. I will visit multiple times to cover most of their production, processing, logistics, and management sections. After the tour, I will consolidate the acquired scientific, technical, management, and transdisciplinary knowledge and synthesize them in pedagogical context for future use i.e., for the classroom teachings and scholarly activities. Appendix A has a partial list of industries and companies in the region.

My sabbatical leave objective-activity plan includes visiting research centers (OA2). There are several research centers in the field/subjects. I have listed four top research units/centers. Appendix B provides brief information about these centers, taken from their web sites. I have chosen two centers that I want to visit (1st and 2nd in the list) at my own expenses. If time permits, I will consider to visit other centers. The first one that I want to visit is the Postharvest Technology Center at UC Davis. I will have meetings with the faculty members and the lab directors in order to get answers and update the research questions that I will be preparing. My second visit will be to AgTech program at UC Merced. UC Merced has a comprehensive program as regards to Agriculture 4.0. As understood, they have been very successful in

receiving internships and the program is funded by a joint grant from the U.S. Department of Agriculture (USDA), the National Institute of Food and Agriculture (NIFA) and the Hispanic Association of Colleges and Universities (HACU). Because of the brand-new nature of the program, they have outstanding and modern infrastructure and resources which include advanced IoT (Internet of Things) technologies such as cyber-physical systems, mobile devices and apps, industrial computers, electronics and communications, unmanned aerial vehicles (drones), most importantly the System Interfaces. System Integration or System-of-Systems (also System Interfaces) plays a key role in Safety and Industry 4.0 (Agriculture 4.0), and they do research and projects in this area. Further, since the program includes Innovation and Entrepreneurship Programs for Hispanic College Students in the Agricultural and Food Processing Industry of California's Central Valley, Safety and Industry 4.0 (includes Agriculture 4.0) are being given prime importance. My visit will be an eye opening and breakthrough as I will holistically understand the scope, features, and aspects of synergistic integrations from interdisciplinary and management point of view. Visiting to world-class agricultural research centers will enable me to observe scholarly activities in the advanced field/subjects of Safety and Industry 4.0 and beyond within IT/ASM disciplines. Overall, I will be able to update the currency, and in particular, I can critically think about the next step because by that time I had already reviewed the context to pursue scholarly activities including writing and submitting of grant proposal to funding agency. I will be able to embed the developmental experience in the courses in Spring 2021 and after and therefore will be able to tangibly engage IT and JCAST students at Fresno State. As mentioned, the courses that I have planned to update, but not limited to (Please see Table 1) are Research Methods (IT 280), and Technical Writing (IT 198w), Senior Problems (IT 199), Independent Study (IT 190/IT 290), and Graduate Projects/Thesis (IT 298/IT 299).

Last but not least, my objective-activity plan includes an international trip to two of the national and state level organizations: Krishi Vigyan Kendra (KVK) run by Indian Council of Agricultural Research (ICAR) that functions under Orissa University of Agricultural Technology, and Industrial Training Institute, Berhampur (ITIB), respectively. KVK is a center-of-excellence type organization in that ICAR has mandated for assessment, refinement and demonstration of improved agro-technologies and products to bring social and economic upliftment of farming community. The activities of the KVK have supported a cross section of farming communities to enhance productivity, evaluation of new technology through On Farm Trials in participatory research mode creating an impact to accept the best technology through Front Line Demonstration followed by capacity building training programmes. Based on the call for global food security by the UN, and since their country's economy primarily depends on agriculture or in other words, since the agricultural sector is the backbone of a densely populated country (1300 Millions), the center like KVK is equipped with agricultural infrastructures and management facilities in Safety and Industry 4.0 and beyond areas. Please note that in connection with "Food Security and Technology", I had organized an UN-sponsored International Symposium as well as a local Seminar on "Industrial Technology Links" at Fresno State in 2008. Also, in 2016, I had presented a paper at an International Conference in India where the session theme was on "Agriculture, Food and Technology". What I am convinced from the horse's mouth is that Safety and Industry 4.0 and beyond plays an important role in IT/ASM discipline and I would like to explore KVK to fulfill my developmental needs from global perspectives. My international trip also includes visiting ITIB. It is a model institute. The

institute and the leaders of the institute have received several notable awards and recognition because of their specialized training in the areas of Safety and Industry 4.0 for Industrial Technology and Agricultural and Food Technology disciplines. In the past, I had academic acquaintances with the Principal who was showing interest for collaboration. I had informed them about our programs and showed interest to explore opportunities, and now it is the time. Recently, I have spoken with the Principal who will be happy to facilitate and accommodate my sabbatical endeavour. These trips will enable me to learn about multidisciplinary areas, diversity, sustainability and management (waste-to-energy), etc. and learn about exchange programs and community relations from a global perspective. The intended courses but not limited to (Please see Table 1) are Technology and Society (IT 20), Exploring Technology Systems (IT 30). If time permits, I will explore more on Safety and Industry 4.0 (Agriculture 4.0) within the local industries and institutes. Some of the local industries and centers etc. that I am interested in are (i) Green-Houses and Nurseries such as State Horticulture Farms and Research Laboratories, and Massive food-storage facilities, (ii) Orissa University of Agricultural Technology, Bhubaneswar (especially the Department of Agricultural Process and Food Engineering and the Department of Farm Machinery and Power), and similar.

I have made some contacts with some of the industries, institutes, centers, and organizations and received responses from them for my tours, visits, and trips to their facilities. Since, my sabbatical request is for Fall 2020, I have enough time (Spring 2020 and Summer 2020) to contact the industry personnels and make my tours, visits, and trips successful. Prior to and during my sabbatical period, if I find more interesting activities by another industry, unit, organization, etc., I will also include them in my tours, visits, trips as my sabbatical proposal is to efficiently use the leave for effective outcomes.

Section 2: Benefits to me

My sabbatical project will help me succeed. I moved from research-oriented (R1) postgraduate only school offering MS and PhD programs to IT Department, Fresno State, a teaching- and scholarly activity oriented school, 12 years ago. After my joining at IT Department, JCAST, in my teachings I have been trying to accommodate applied areas of electronics, process control, automation, and research methods but so far I have been validating the application areas by using simulation platforms (virtual domains). Thus, my teachings have been generic. I am actually interested to align my teachings toward applied (experiencial-, and project-based) learning. To maintain the sustained pattern of excellence in teaching and scholarly activities, I need to dilate the scope of my teachings and scholarly activities more on applied areas of topical subjects such as Technology and Society, Safety Management, Electronics and Digital Systems, Automated Processing, Research Methods, Senior Problems, Independent Studies, Graduate Projects/Theses that I am currently teaching within the IT/ASM disciplines. I am sure I will gain knowledge by going back to tens of onsite places (industries, centers, institutes, organizations, etc.) where I can be immersed myself in the real-world climate. I have done this in the past and had acquired the developmental needs, and was successful. I believe that this sabbatical leave will also give me similar benefits (developmental and currency). Please note that I have been trying to make tours, visits, trips, etc. that I am proposing in this application since six years, but unable to accomplish

because of my regular workload such as teaching, scholarly activity, and administration/service assignments.

At this stage of my teaching career at Fresno State, I feel that developmental needs is a must for me. Even for academic administration/service positions at Fresno State, maintaining curricular currency in applied areas of relevant Major/discipline is entailed because part of my faculty assignments also include administration/services albeit my primary assignment is teaching. I want to visit industries, centers, institutes, and organizations closely associated with Safety and Industry 4.0 and beyond and conduct developmental activities (including research, analysis, and synthesis) about how they utilize science, engineering, and technology in their processes, production, machinery, planning, management, logistics, and communication. I expect to learn some new automation, manufacturing, processing, safety, technology implementations, software tools and systems, analytics, internet of things, cyber-physical systems, and so on. Such transdisciplinary experience will immediately augment the academic enhancement and increase the capability, capacity, and links for the purpose of future engagement and community service activities that will continue to function. Learning more about the latest Safety and Industry 4.0 and beyond within IT/ASM disciplines not only will help enhance the scope of my teaching and subject matter but also become a better teacher, researcher, and leader.

Tools and techniques in Industrial Technology and Agriculture and Food in Fresno County and around is more high-tech now than in the past. I expect to spend a good amount of time with the industries, as mentioned earlier, and will try to re-immerse myself. A mere touring these companies will not fulfill my developmental hunger. I want to find out some specifics about how their operations work. Major topic categories include scientific, technical, academics, management, and handling. *Scientific and technical*: (i) the underlying principle and integration methods, (ii) the modular designs, (iii) control systems and instrumentation, (iv) computer software and management, (v) human machine interfaces, and (vi) technology trends; *Academics*: Related to academics, I want to inquire about (i) student involvement and industry-institute interaction programs, (ii) relationship with training centers, (iii) training to customers, and manufacturers, and (iv) any certification programs and involvement; *Management*: Management related questions will be to learn about (i) various organizational structure and hierarchy in staffing and professionals, (ii) the organizational links with the professional societies and benefits, (iii) research and development based on mistakes made during operation, (iv) start-up time vs. current achievements, plans, and trends, and (v) recommendations about starting a new facility including outreach and extension, etc.; *Handling:* I want to learn about how they handle (i) memberships with partnering companies, (ii) research grants, (iii) internship and paid project work, (iv) other funding source, etc. I know that I will refine and expand the strategic queries listed above prior to the sabbatical leave.

The same essence applies to research center visits. It is impossible to list what I could learn or bring back from a center that specializes in areas listed in this application. I will learn about recent research successes, results, and interdisciplinary applications with follow ups within IT/ASM disciplines.

Through my international trip to the technology-centered, management-oriented, real-world agricultural organizations, I am sure I will gain a great deal of contexts for developmental needs by exploring their infrastructure, facilities, resources, and scope of research, outreach, and extension. I will gain knowledge about next generation Safety and Industry 4.0 and beyond within IT/ASM disciplines.

Please note that although I will learn some of these remotely (Please see OA4 in Table 1), but a significant portion of the sabbatical plan (OA1-OA3) includes physical tours/visits/trips of the industries and learn and make analysis onsite as well. The tours, visits, and trips will not only enable me to update the currency but also activate critical thinking areas to pursue teaching and scholarly activities in the advanced areas of IT/ASM discipline by aptly engaging IT and JCAST students at Fresno State. The visit will also enable me to list the review items and methodology required to write and submit grant proposals to the funding agencies in future. Sabbatical in Fall 2020 will widen my field of specialty through a real-world experience approach which in turn will allow me to enhance the scholarship of application and integration.

Section 3. Benefits to the Department/College/University

Safety and Industry 4.0 and beyond are important topical subjects within IT/ASM disciplines. The department of Industrial Technology is trying to develop or update the courses or curriculum in the advanced areas of these topical subjects. As my plan includes multiple tours, visits and trips to the industries, research centers, and institutes to facilitate developmental engagement opportunities leading to articulation of knowledge-base in Safety and Industry 4.0 and beyond within IT/ASM disciplines for the department curriculum, the benefits of this sabbatical leave to Fresno State are far reaching. The local, regional and international trip will enhance the connection and link and establish opportunities for collaboration and community relations and learnings. I will be rejuvenated and passionate about my teaching and service, with new ideas to demonstrate. This sabbatical will make me a better teacher. So at the least, Fresno State will get a better teacher.

The tours, visits, and trips followed by synthesis and pedagogical context-building will enable me to update the currency of applied technology and also think about the next step of pursuing scholarly activities in the advanced areas of Safety and Industry 4.0 and beyond. As I mentioned earlier, the outcome of this sabbatical will enable me to list the review-items required to write and submit grant proposals to the funding agency at Fresno State in future and to engage IT and JCAST students in the demanding areas of IT/ASM discipline at Fresno State, boldly. Personally, this sabbatical leave will help me to improve the following courses within the curriculum: Technology and Society (IT 20), Exploring Technology Systems (IT 30), Electricity and Electronics (IT 52), Safety Management (IT 92), Industrial Process Control Systems (IT 112), Automated Systems I (IT 131), Research Methods (IT 280), and Technical Writing (IT198w), Senior Problems (IT 199), IT 190 (Independent Study), IT 191T (Topics in Industrial Technology), IT 194I (Cooperative Education in Industrial Technology), IT 290 (Graduate Independent Study), Graduate Projects/Thesis (IT 298/IT 299). Clearly, there are benefits to the department, i.e.: enlarged recruitment platform; expanded career market for graduates; enhanced presence in the region and internationally; and sustained research opportunities. The knowledge

to be gained through sabbatical will facilitate the embodiment of the department to the body of JCAST. Eventually, it will solidify the JCAST goal to integration of academic program into research unit.

Section 4: Detailed Timeline

The breadth of activities that am going to undertake for sabbatical will cover the entire Fall 2020 semester. I will use the entire semester effectively. Table 2 shows a timeline for the completion of objective-activities. The timeline slots for the accomplishment of individual objective-activity are flexible and may change in order to accommodate the best schedule possible.

Table 2: Timeline

OAs	Timeline	Remarks
OA1	1st Day of Instruction of Fall 2020 to Mid of October 2020	● Schedule for the tours ● Visit 12-15 industries/companies/orgs or more as time permits ● Complete (a) - (c) for OA1 as cited in column 3 of the Table 1 above. ● Analyze and prepare blueprint for (d) ● Work equivalent to 7-8 weeks.
OA2	1st Day of Instruction of Fall 2020 to Mid of October 2020	● Schedule for the visits ● Visit at least two world-class centers ● Complete (a) - (d) for AO2 as cited in column 3 of Table 1 above. ● Analyze and prepare blueprint for (e) ● Work equivalent two weeks.
OA3	Mid of October 2020 to End of the Fall Semester 2020	● Schedule for the trip/visit. ● Travel and arrive at the center(s); Visit at least two organizations ● Complete (a) - (e) for AO3 as cited in column 3 of the Table 1 above. ● Analyze and prepare blueprint for (f) ● Work equivalent to 8 weeks (That is the remaining portion of he FL20 semester.)
OA4	Fall 2020	● List authentic online sites (organizations, universities, centers, etc.), publishers, webinars, etc. and visit remotely. ● Attend webinars ● Work equivalent to two weeks ● Analyze and prepare blueprint

For all OAs	Fall 2020	● On the go, while making tours and visits organize, document and keep records of available resources on the subject matters ● Prepare first/second drafts considering advanced teaching pedagogy which were learned through Fresno State trainings ● Search for authentic and valuable open resources (e.g., policies, andardizations, mandates, etc. - regional, national, global, etc.) for students, and keep records.

Appendix A

A partial list of industries, companies and stakeholders.

FMC (An Agricultural Science Company)
2300 West Industrial Avenue,Madera, CA, 93637
https://www.fmccrop.com/grower

Berry Global Inc.
14000 Monte Vista Ave, Chino, CA 91710
https://www.berryglobal.com/

Sinclair Systems International LLC
3115 S Willow Ave, Fresno, CA 93725
https://www.sinclair-intl.com/

Electric Motor Shop and Supply
253 Fulton Street, Fresno, CA 93721
http://www.electricmotorshop.net/

Total Control - Fresno
www.rsdtotalcontrol.com

Ruiz Foods, Inc.
501 S Alta Ave, Dinuba, CA 93618
https://www.elmonterey.com/

Essentra Components
21303 Ferrero Pkwy, City of Industry, CA 91789
https://www.essentracomponents.com/en-us#

Cornell Pump Company
16261 SE 130th Ave, Clackamas, OR 97015
https://cornellpump.com/

Mazzei Injector Company, LLC
500 Rooster Drive, Bakersfield, CA 93307 USA
www.mazzei.net

AC Foods/SumoCitrus/Suntreat
1117 County Hwy G4, Milpitas, CA 95035
38773 Rd. 48, Dinuba, CA 93618

35825 Rd. 192, Woodlake, CA 93268
www.SumoCitrus.com
www.Suntreat.com

Lions Raisins
9500 De Wolf Ave, Selma, CA 93662
http://www.lionraisins.com/

ADCO Manufacturing
2170 Academy Avenue, Sanger, CA, 93657
www.adcomfg.com

Jain Irrigation
2851 E Florence Ave, Fresno, CA 93721
https://www.jainsusa.com/

Olam Spices & Vegetable Ingredients
205 E. River Park Circle, Fresno, CA 93720
www.olamonline.com

Processes Unlimited International, Inc.
5500 Ming Avenue, Bakersfield, CA, 93309
https://www.manta.com/c/mmd8v11/processes-unlimited-international-inc

Serpa Packaging Solutions
7020 W. Sur, Visalia, CA, 93291
www.serpapkg.com

Sun-Maid Growers of California
3100 Zinfandel Drive Ste 280, Rancho Cordova, CA, 95670
https://www.sunmaid.com/

Wawona Frozen Foods
(Contact person: Mr. Finley Timothy, Production Manager)
100 W. Alluvial, Clovis, CA, 93611

WeatherTec
5645 E. Clinton Avenue | Fresno, CA 93727
https://www.weathertec.com/

Automated Control & Technical Services
2560 S East Ave, Fresno, CA 93706 or 4545 N. Brawley Ave, Fresno, CA, 93722
(or Bakersfield facility)

Harris Ranch
29475 Fresno Coalinga Rd, Coalinga, CA 93210
https://www.harrisranchbeef.com/contact-us/

Royal Madera Vineyard
30957 Avenue 8, Madera, CA 93637
http://royalmaderavineyards.com/food-safety/

Tractor Supply Co.
1131 W Pacheco Blvd, Los Banos, CA 93635
https://www.tractorsupply.com

Appendix B

Brief information about the research centers (taken from their web sites.).

1. ***Postharvest Technology Research Center***
   University of California, Davis
   One Shields Avenue - MS 2
   1057 Wickson Hall
   Davis, CA 95616

The Center have significant activities with regard to research and extension programs on agriculture and food which includes but not limited to ripening development, temperature management, retail temperature storage conditions, retail displays and handling, tools to control, quality measurements, environmental equipment, safety factors, harvesting systems, preparation for market, packinghouse facilities and equipment, containers, evaluation of efficiency, standardization, storage, transportation, energy use in postharvest technology procedures, marketing, and safety assurance. A paragraph reads as follows.

"The Center was founded in 1978 by Adel Kader with the goal of organizing and coordinating knowledge transfer regarding reduction of postharvest losses and improving the quality and marketability of fresh horticultural products. The research findings disseminated during this era by Kader and a cadre of colleagues is the cornerstone and foundation for our current year-round supply and global sourcing of quality fresh and minimally-processed produce and cut flowers. Our mission today is to remain a leading source of information on quality, safety and marketability of fresh produce and to sustain the viability of the Center for the next generation of scientists and practitioners. Our immediate goal is to broaden the level of involvement among our basic, applied and extension faculty and use the PTC platform to distill, translate, and disseminate emerging technology advancements to a broader industry and affiliated stakeholder audience."

University of California Agriculture and Natural Resources is a UC Cooperative Extension system and it has several units at UC Davis. In order to gain broader breadth of knowledge, while visiting Postharvest Technology Center at UC Davis, I will also make arrangements to visit other centers of UC Cooperative Extension such as Informatics and Geographic Information Systems (IGIS) Program, UC Agricultural Issues Center, and Sustainable Agriculture Research Education Program (SAREP) at UC Davis.

2. ***USDA AgTech Center at UC Merced***
   5200 North Lake Rd. Merced,
   CA 95343 T: (209) 228-4400

AgTech program at UC Merced has been very successful in receiving internships and the program is funded by a joint grant from the U.S. Department of Agriculture (USDA), the National Institute of Food and Agriculture (NIFA) and the Hispanic Association of Colleges and Universities (HACU) for advanced technologies such as computers, electronics and communications — including unmanned aerial vehicles (UAVs), or drones. It includes Innovation and Entrepreneurship Programs for Hispanic College Students in the Agricultural and Food Processing Industry of California's Central Valley. Safety and Industry 4 is being given prime importance. The website page reads as follows.

"Logo and UC MercedAdvanced technologies such as computers, electronics and communications — including unmanned aerial vehicles (UAVs), or drones — have begun to fundamentally change the agricultural and food industry in the United States.

All stages of agricultural production require extensive knowledge of sophisticated technologies and engineering, as well as basic knowledge of entrepreneurship, management, economics and finance. Advanced technologies and the agricultural market have created significant needs for engineers trained in a variety of technical and business fields.

We present an internship program initiative for educating underserved students from California's Central Valley to prepare them for the new agricultural industry.

The program was funded by a joint grant from the U.S. Department of Agriculture (USDA), the National Institute of Food and Agriculture (NIFA) and the Hispanic Association of Colleges and Universities (HACU). This project aims to develop an innovative modular approach to enrich the mechanical engineering curriculum by introducing students to advanced technologies. The program is designed to prepare our students by providing them with training in a broad range of skills focused on advanced technologies, so that they will be able to help build the future of the agricultural and food industries in the Central Valley and around the country.

The program follows USDA educational strategies, while the planned long-term outcome meets a number of NIFA priorities, including food safety and water quality."

3. ***Food Processing Technology Division***
   Georgia Tech Research Institute,
   Food Processing Technology Building, Atlanta, GA 30332-0823,
   Phone: 404.407.8812, Fax: 404.894.8051

The Food Processing Technology Division (FPTD) is a division at the Georgia Tech Research Institute (GTRI) has a mission to enhance the productivity of Georgia's agribusiness and the competitiveness of Georgia's food processing industry. The FPTD conducts significant research

on food quality and safety while minimizing environmental impacts by applying computer vision, robotics, plant ergonomics, biosensors, and flexible computing and information systems technologies. FPTD researchers are focused on Advanced Imaging and Sensor Technologies, Robotics and Automation Systems, Environmental Systems, Energy and Fuel Cell Research , and Worker and Product Safety Research. Since 1973, FPTD's Agricultural Technology Research Program (ATRP) has provided innovative engineering research and development for the poultry industry in particular and the food-processing industry at large. The program's researchers have studied the challenges facing this important industrial sector in developing a number of technologies for improving processing efficiency and effectiveness. Though oriented toward the food industry, FPTD's work is applicable across many industries. Research focus on Robotics and Automation Systems use sophisticated algorithms and control software. GTRI researchers have created a robotic arm from inexpensive components that is capable of the precision needed to thread a needle. Some of the research focus are (1) GTRI Designs Inexpensive Robot Arm Capable of Threading a Needle - AUVSI Unmanned Systems, (2) Technologies based on visual servoing to guide robotic arms for a more intuitive and efficient operator experience, (3) 3D Vision and Control for Robotics Research at Georgia Tech - AUVSI Unmanned Systems.

4. ***California Foundation for Agriculture in the Classroom***
   2600 River Plaza Drive, Suite 220
   Sacramento, CA 95833-3293

California Foundation for Agriculture in the Classroom has a significant amount of information about food and agriculture for students who are interested for ag and food education. Early education plays an important role in building a sustainable community. I am interested to explore how California Foundation for Agriculture in the Classroom is considering Safety and Industry 4.0 (or Agriculture 4.0) in their curriculum. Their mission and objectives are very cler and they have a strong Board. The website reads as follows.

“The California Foundation for Agriculture in the Classroom is a non-profit organization dedicated to educating youth throughout California about the importance of agriculture in their daily lives. We do this through:

- Developing materials that are accurate, teacher-tested and scientifically sound to enhance the educational experience of K-12 students.
- Providing programs, inspiration and training opportunities for educators.
- Partnering with like-minded organizations to create awareness about the significance of agriculture in our everyday lives.
- Recognizing teachers and students for their achievements in agricultural literacy.
- Supporting the pursuit of agricultural careers and continuing education.
- Our mission is to increase awareness and understanding of agriculture among California's educators and students. Our vision is an appreciation of agriculture by all.”

Appendix C

Information on KVK and ITIB and their address and objectives

1. ***Krishi Vigyan Kendra (Center of Agricultural Sciences)***
   AT/P.O.: Mahisapat, Dist : Dhenkanal (Odisha), India, PIN : 759013

Indian Council of Agricultural Research (ICAR) Vision Statement
"The Indian Council of Agricultural Research is an apex research organization of the country with a high standing amongst international agricultural research institutions. Since its inception in 1930, the Council has been spearheading agricultural research, education and extension activities for productivity enhancement and diversification of Indian agriculture.

The world as a whole is undergoing several transformative changes. Growing population, changing lifestyles, expanding urbanization and accelerated climate changes are creating new challenges for the national agricultural research system. Whereas in the past, the challenge was to supply adequate food, but now it is to provide adequate nutrients to promote health; and in the future, the challenge would be to provide optimal nutrients based on individual's genetic profile. Fortunately, along with challenges, the developments in science are creating new avenues for tackling the challenges. The Indian Council of Agricultural Research (ICAR) and the National Agricultural Research and Education System at large, are determined to harness the advances of science for the welfare of society. The Council is committed to transform itself into an organization engaged fully with the farmers, industry, entrepreneurs and consumers at large.

To keep pace with the changing environment, the ICAR has been updating its visions and strategies from time to time. The first systematic effort to envision the challenges and opportunities, and formulate its own strategy was undertaken in the last year of the 20th century by preparing 'Vision 2020 document'. The next attempt was after five years by bringing out the 'Perspective Plan' and the 'ICAR Vision 2030', coinciding with XI plan. 'ICAR Vision 2050', provides the strategic framework for innovation-led inclusive and sustainable agricultural growth in the country."

ICAR Divisions and Units
Crop Science; Horticultural Science; Natural Resource Management; Agricultural Engineering; Animal Science; Fisheries Science; Agricultural Education; Agricultural Extension; Knowledge Management; IP&TM and PME; Human Resource Management Unit; National Agricultural Science Fund (NASF); International Relations; Administration; Finance

Mandate and Activities of KVKs:
The mandate of KVK is Technology Assessment and Demonstration for its Application and Capacity Development.

- To implement the mandate effectively, the following activities are envisaged for KVK.
- On-farm testing to assess the location specificity of agricultural technologies under various farming systems.

- Frontline demonstrations to establish production potential of technologies on the farmers' fields. Capacity development of farmers and extension personnel to update their knowledge and skills in modern agricultural technologies.
- To work as Knowledge and Resource Centre of agricultural technologies for supporting initiatives of public, private and voluntary sector in improving the agricultural economy of the district.
- Provide farm advisories using ICT and other media means on varied subjects of interest to farmers

Other objectives in Higher Education areas

- Strengthening and Development of Higher Agricultural Education.
- Human Resources Development for leadership roles in agricultural sciences.
- Improving Quality of Agricultural Education through innovative approaches in teaching, research, outreach activities.

2. ***Industrial Training Institute***
   Engineering School Road Berhampur-760010, Odisha, India
   http://itiberhampur.in/institute-overview/

Directorate of Technical Education and Training, Government of Odisha administers ITIs. The ITI, Berhampur is a model institute in one of the states in India. The Principal has received several notable awards and recognition because of training in the areas of Safety and Industry 4.0 for Industrial Technology and Ag and Food Tech disciplines. The head was also selected to get a Singapore Govt Cooperation Award from the Ministry of foreign Affairs Singapore.

I have past acquaintances with the Principal who was showing interest for collaboration. I had informed them about our programs and showed interest to explore opportunities, and now is the time. Recently, I have spoken with the Principal who will be happy to facilitate and accommodate my sabbatical endeavour. The ITI website reads as follows.

"Industrial Training Institute, Berhampur, was started in the year 1957-1958 is the largest GOVT ITI in the state in terms of seating capacity having more than 3000 seats. This is the only one ISO 9001:2008 certified Government training institute in the state. It is having 26 numbers of trades. The institution is situated at the threshold of "Silk City", Berhampur, the southern part of Odisha by the side of NH-217. It is just 11 km. away from Gopalpur-on-sea.This is taking leading role for placement of students in the state."

3. ***Local industries and laboratories.***
   a. *State Horticulture Farm (an extension of Central Horticultural Experiment Station, Aiginia, Bhubaneswar a regional station of ICAR -Indian Institute of Horticultural Research);*
   b. *Odisha tissue culture laboratory and Mango-hub research center, Dhenkanal*
   c. *Orissa University of Agricultural Technology, Bhubaneswar (Department of Agricultural Process and Food Engineering and the Department of Farm Machinery and Power).http://www.ouat.nic.in/collegeofagriculturalengineering%26technology*