National Science Foundation
Transforming Undergraduate Education in Science, Technology, Engineering, and Mathematics (TUES)
formerly known as CCLI

Grant Proposal Workshop
March 8, 2010
Workshop Overview

- NSF and TUES Program Information
- TUES Application and Submittal Process
- Working with SJSURF - The Proposal Process
Transforming Undergraduate Education in Science, Technology, Engineering, and Mathematics

www.nsf.gov/funding/pgm_summ.jsp?pims_id=5741
Transforming Undergraduate Education in Science, Technology, Engineering, and Mathematics (TUES)

The title of the program was changed from "Course, Curriculum and Laboratory Improvement (CCLI)" to TUES in order to emphasize the special interest in projects that have the potential to transform undergraduate STEM education.
TUES (formerly known as CCLI)

Transforming Undergraduate Education in Science, Technology, Engineering, and Mathematics

Transformation Spectrum

Incremental Steps Leading to... Revolutionary
Additional *review criteria* have been modified to emphasize the desire for projects that:

(1) propose materials, processes, or models that have the potential to enhance student learning and to be adapted easily by other sites.

(2) involve a significant effort to facilitate adaptation at other sites.
Maximum budgets for Type 1 and 2 have increased.

A statement has been added to the description of the Type 1 project indicating that successful projects should be institutionalized at the investigator's college or university and a question on institutionalization has been added to the additional review criteria.

Each proposal that requests funding to support postdoctoral researchers must include a description of the mentoring activities that will be provided for such individuals.
TUES Vision – excellent science, technology, engineering, and mathematics (STEM) education for all undergraduate students.

TUES Goal – to bring about positive transformation of undergraduate STEM education to improve the quality of science, technology, engineering, and mathematics education of all undergraduate students.
TUES supports the following:

- The creation and adaptation of learning materials.

- Projects that enhance understanding of how students learn STEM topics and how faculty members adopt instructional approaches.

- Projects that build capacity to assess learning and evaluate educational innovations.

- Projects that further the work of the program itself, for example, synthesis and dissemination of findings across the program.

- TUES especially encourages projects that have the potential to transform the conduct of undergraduate STEM education

- Projects that explore cyberlearning, specifically learning with cyberinfrastructure tools such as networked computing and communications technologies, are of special interest.
TUES – project components

- All proposals must contribute to the development of exemplary undergraduate STEM education.

- Typically projects include one or more of the TUES project components and they build on prior knowledge, both in the STEM fields and in undergraduate education.

- In addition, TUES welcomes proposals describing untested, forward-looking, and unconventional activities that could have a high impact and contribute to transforming undergraduate STEM education. Prospective principal investigators for this kind of project should discuss their ideas with a TUES Program Officer in advance of proposal submission to help gauge the appropriate scope and scale of the proposal.
Creating Learning Materials and Strategies - new learning materials and strategies for improving courses, curriculum, and laboratories should be guided by research on teaching and learning and should incorporate and be inspired by advances within the discipline.

Implementing New Instructional Strategies – the implementation of strategies to reflect proven promising pedagogical techniques in ways that encourage wide spread adoption of such successful instructional strategies.

Developing Faculty Expertise - the design and implementation of methods that enable faculty to gain expertise in new learning materials and teaching strategies.

Assessing Student Achievement - designing tools to measure the effectiveness of new materials and instructional methods.

Conducting Research on Undergraduate STEM Education - results from assessments of learning and teaching as well as from projects emphasizing other components in the cyclic model.
Important TUES Project Features

Regardless of the number of components they address, all promising projects should share the following characteristics:

- Quality, Relevance, and Impact
- Student Focus
- Use of and Contribution to Knowledge about STEM
- STEM Education Community Building
- Expected Measurable Outcomes
- Sustainability
- Project Evaluation

Note – speak specifically to these project features in your proposal narrative using NSF’s language.

See page 7 of program solicitation.
The TUES program is accepting proposals for four types of projects:

**Type 1** projects are expected to be significant enough to contribute to understanding undergraduate STEM education. (May 26, 2010 deadline)

**Type 2** projects typically address more than one program component, or if they focus on a single component will address it at a scale that goes well beyond a single institution. (January 2011 deadline)

**Type 3** projects as intended support large scale efforts. Such projects may involve regional or national effort to disseminate proven materials or pedagogies, such as a study involving a broad range of diverse institutions that explore how various factors affect how students learn. (January 2011 deadline)

**Central Resource** projects as assume responsibility for leadership and implementation of activities that sustain the TUES community, such as a project to organize and implement meetings of Principal Investigators funded by TUES and its predecessors. (January 2011 deadline)

See page 8 of solicitation for examples of Types
NSF Merit Review Criteria -- Mandatory

All NSF proposals are evaluated through use of the two National Science Board (NSB)-approved merit review criteria: intellectual merit and the broader impacts of the proposed effort. In TUES, NSF employs additional criteria to highlight the specific objectives of the program.

What is the intellectual merit of the proposed activity?

- How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields?
- How well qualified is the proposer (individual or team) to conduct the project?
- To what extent does the proposed activity suggest and explore creative and original concepts?
- How well conceived and organized is the proposed activity? Is there sufficient access to resources?
- TUES - Will the project produce exemplary material, processes, or models that enhance student learning and can be adapted easily by other sites?
- TUES - Will evaluation and research projects yield important findings related to student learning?
- TUES - Does the project build on existing knowledge about STEM education?
- TUES - Are appropriate expected measurable outcomes explicitly stated and are they integrated into an evaluation plan?
- TUES - Is the evaluation effort likely to produce useful information?
- TUES - Are the plans for institutionalizing the approach at the investigator's college or university appropriate?

What are the broader impacts of the proposed activity?

- How well does the activity advance discovery and understanding while promoting teaching, training, and learning?
- How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)?
- To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships?
- Will the results be disseminated broadly to enhance scientific and technological understanding?
- What may be the benefits of the proposed activity to society?
- TUES - Does the project involve a significant effort to facilitate adaptation at other sites?
- TUES - Will the project contribute to the understanding of STEM education?
- TUES - Will the project help build the STEM education community?
- TUES - Will the project have a broad impact on STEM education in an area of recognized need or opportunity?
- TUES - Does the project have the potential to contribute to a paradigm shift in undergraduate STEM education?
Furthermore, NSF staff will give careful consideration to the following in making funding decisions:

**Integration of Research and Education**

“One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learning perspectives.”

**Integrating Diversity into NSF Programs, Projects, and Activities**

“Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.”
Application and Submittal Information

- Award Information
- Receipt, Review, and Anticipated Start Dates
- Working with the SJSU Research Foundation
- TUES Content and Forms
- Compliance
- Budget – Allowable and Unallowable Costs
Award Information

Type 1 Projects – total budget up to $200,000 for 2 to 3 years. ($250,000 when four-year universities collaborate with two-year colleges.)

Type 2 Projects – total budget may not exceed $600,000 for 2 to 4 years.

Type 3 Projects – total budget negotiable, (may not exceed $5 million over 5 years).

Central Resource Projects – total budget negotiable, depends on scopes and scale, but may not exceed $3 million.
Receipt, Review, and Anticipated Start Dates

Submittal Deadline: Type 1: 5/26/10

To SJSURF Deadline: Type 1: 5/19/10 or sooner

After Submittal NSF reviews, corresponds, and awards.

Earliest Anticipated Start Date: 12/1/10

Deadline for Phase 2, 3 & Central Resource: 1/14/11
**Strongly** suggested timeline

**Now thru May 17, 2010**
PI notifies Sponsored Programs Manager of intent to propose to TUES program and begins working with manager on budget and other details. PI begins sending documents.

**May 17, 2010**
PI sends the TUES Final project description and the OK on the final budget to SJSURF no later than this date for routing.
SJSURF creates routing package and routes.

**May 25, 2010**
PI ensures all final document edits have been sent to SJSURF. SJSURF finishes uploading on or before May 25.

**May 25, 2010**
SJSURF submits proposal using NSF FastLane on or before May 25 by 5pm.
Working with the SJSU Research Foundation

**Project Director:**
- Notifies SJSURF early in the process
- Works with SJSURF on budget
- Provides proposal documents to Manager
- Obtains peer review, internal or external
- Allows at least 7-14 calendar days for campus routing process
- Plans for SJSURF to submit in advance of any deadline

**Sponsored Programs Manager:**
- Assists with budget preparation
- Accepts and prepares proposal documents for routing
- Ensures compliance to guidelines-format, content, regulations
- Facilitates review and approval by SJSU campus signers
- Uploads documents to NSF FastLane
- Submits proposal using NSF FastLane
## Content and Forms

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<td>Project Description</td>
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<td>Biosketches (in NSF format)</td>
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<tr>
<td>Supplementary Docs: letter of Institutional endorsement; collaborator commitment letters; samples of expected project outcome</td>
<td>PI</td>
<td>Limited to letters and samples (survey tools, screen shots, sample chapter)</td>
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<tr>
<td>Suggested Reviewers or Reviewers to Exclude</td>
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<td>Optional – No limit</td>
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TUES GUIDELINES:

Grant Proposal Guide:
http://www.nsf.gov/pubs/policydocs/pappguide/nsf10_1/gpg_index.jsp
NSF SUPPLEMENTARY INSTRUCTIONS

The following information supplements the GPG:

NSF asks principal investigators to

- make sure the proposal responds to the list of questions provided both in the general review criteria and in the additional program-specific review criteria.

- review the components, types, and important features to make sure you have chosen the correct TUES program type.


- match the proposed budget carefully to the scope and scale of your project. Excessive or poorly justified budgets indicate to NSF that the project is not well designed.

- to take advantage of the National STEM Distributed Learning (NSDL) resources for project dissemination. This involves contributing metadata about project sites and individual resources. Guidelines for contribution may be found at http://nsdl.org/contribute. NSDL resources also offer an array of technology tools and community support services that may be of utility to TUES projects, including resource cataloging and collection management tools, as well as group workspaces and collaboration, outreach, and professional development opportunities. Inquiries may be submitted via http://nsdl.org/about/contactus. PIs may want to include funds in their budgets to cover required cataloging/metadata and/or software engineering expertise. They should contact the NSDL portal directly (http://nsdl.org/about/contactus/) to obtain more specific guidance on cost estimates for collection building and contribution to NSDL resources.

- comply with the section of the GPG on Proposals Involving Human Subjects (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg). SJSU PIs must submit an IRB application or request for an IRB exemption as soon as possible to Alena Filip in Graduate Studies and Research and also provide a copy to the SJSURF Sponsored Programs Manager.

- know that as a part of the Supplementary Documentation, the PI may include letters showing collaborator commitments and organizational endorsement. In addition, for those projects whose deliverables include a final product, samples of these products (such as excerpts from book chapters, assessment tools, screen shots of software, sample teaching modules and other project deliverables) may be placed within the Supplementary Documentation section. These sample materials should be concise and relevant.
Areas of Compliance Review:

- Human Subjects
- Animal Subjects
- Curriculum Changes
- Carcinogens
- Radioactive Materials
- Biohazards
- Recombinant DNA
- Cell Lines
Compliance

Human Subjects:

Institutional Review Board (IRB)

The nature of TUES project data collection, assessment and evaluation creates human subjects activities (surveys, interviews, questionnaires, and other data collection methods).

Requires NIH Online Training if not previously completed. (2 hours).

GS&R IRB Website http://www2.sjsu.edu/gradstudies/Research/irb.html

For more information contact:

Alena Filip, IRB Coordinator, (408) 924-2479 or alena.filip@sjsu.edu
Compliance

Animal Subjects – Institutional Animal Care and Use Committee (IACUC)
SJSU has established an IACUC, which is qualified through the training and expertise of its members to oversee the institution's animal care and use program, university facilities, and all animal-related activities.

GS&R IACUC Website: http://www.sjsu.edu/gradstudies/iacuc/

Larry Young, IACUC Coordinator, (408) 924-4929 or lyoung@science.sjsu.edu
<table>
<thead>
<tr>
<th>Allowable Costs</th>
<th>Unallowable Costs</th>
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<tr>
<td><strong>Must be related and integral to the project</strong></td>
<td><strong>Overload</strong></td>
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<td><strong>Salaries and Fringe</strong></td>
<td><strong>Support for Foreign Institutions</strong> or foreign component</td>
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<td>Faculty salaries-Release time and Summer salary requested should not exceed the equivalent of two months academic year salary.</td>
<td><strong>Costs for Routine Teaching Activities</strong></td>
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<td><strong>Equipment</strong></td>
<td><strong>Secretarial or Clerical Costs</strong> unless warranted by a large-scale program with extraneous administrative components. Must be thoroughly justification.</td>
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<td><strong>Travel</strong></td>
<td><strong>Replacement equipment or instrumentation</strong> that does not significantly improve instructional capability</td>
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<td><strong>Participant Support</strong></td>
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<tr>
<td><strong>Materials and Supplies</strong></td>
<td><strong>Routine laboratory furnishings</strong> such as refrigerators and simple balances</td>
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<tr>
<td><strong>On-site assembly of multi-component instruments</strong></td>
<td><strong>General utility items</strong> such as office equipment (including word-processing equipment), benches, tables, desks, chairs, storage cases, and routine supplies</td>
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<td><strong>Publication, documentation, dissemination</strong></td>
<td><strong>Maintenance equipment and maintenance or service contracts</strong></td>
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<tr>
<td><strong>Computer Services</strong></td>
<td><strong>Modification, construction, or furnishing of laboratories or other buildings</strong></td>
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<tr>
<td><strong>Consultants/Independent Contractors</strong></td>
<td><strong>Installation of equipment or instrumentation</strong> (as distinct from the on-site assembly of multi-component instruments--which is an allowable charge).</td>
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<td><strong>Subawards to Collaborating Institutions</strong></td>
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<td><strong>F&amp;A (Facilities and Administrative Cost): 43.4%</strong></td>
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</tbody>
</table>
NSF encourages proposers to contact a DUE Program Director in their discipline before completion of the Project Description:

### Biological Sciences
Deborah Allen, Program Director, telephone: (703)292-4653, email: deallen@nsf.gov
Kathleen Bergin, Program Director, telephone: (703)292-5171, email: kbergin@nsf.gov
Linnea Fletcher, Program Director, telephone: (703)292-4634, email: lafletch@nsf.gov
James Hamos, Program Director, telephone: (703)292-4687, email: jhamos@nsf.gov
Joan Prival, Program Director, telephone: (703)292-4635, email: jprival@nsf.gov
Daphne Rainey, Program Director, telephone: (703)292-4671, email: drainey@nsf.gov
Terry Woodin, Program Director, telephone: (703)292-4657, email: twoodin@nsf.gov

### Chemistry
Eun-Woo Chang, Program Director, telephone: (703)292-4674, email: ewchang@nsf.gov
Susan Hixson, Program Director, telephone: (703)292-4623, email: shixson@nsf.gov
Bert Holmes, Program Director, telephone: (703)292-5128, email: bholmes@nsf.gov
Herbert Richtol, Program Director, telephone: (703)292-4648, email: hrichtol@nsf.gov
Curtis Sears, Program Director, telephone: (703)292-4639, email: csears@nsf.gov
Hannah Sevian, Program Director, telephone: (703)292-5108, email: hsevian@nsf.gov

### Computer Science
Guy-Alain Amoussou, Program Director, telephone: (703)292-4645, email: gamousso@nsf.gov
Scott Grissom, Program Director, telephone: (703)292-4643, email: sgrissom@nsf.gov
Victor Piotrowski, Program Director, telephone: (703)292-5141, email: vpiotrow@nsf.gov
NSF Contacts continued...

**Engineering**
Ning Fang, Program Director, telephone: (703)292-8637, email: nfang@nsf.gov
Ann McKenna, Program Director, telephone: (703)292-4629, email: amckenna@nsf.gov
Don Millard, Program Director, telephone: (703)292-4620, email: dmillard@nsf.gov
Lance Perez, Program Director, telephone: (703)292-4640, email: lperez@nsf.gov
Russell Pimmel, Program Director, telephone: (703)292-4618, email: rpimmel@nsf.gov

**Geological Sciences**
David Matty, Program Director, telephone: (703)292-5323, email: dmatty@nsf.gov

**Interdisciplinary**
Daphne Rainey, Program Director, telephone: (703)292-4671, email: drainey@nsf.gov
Herbert Richtol, Program Director, telephone: (703)292-4648, email: hrichtol@nsf.gov
Curtis Sears, Program Director, telephone: (703)292-4639, email: csears@nsf.gov

**Mathematics**
Dennis Davenport, Program Director, telephone: (703)292-4659, email: ddavenpo@nsf.gov
Stephanie Fitchett, Program Director, telephone: (703)292-4653, email: sfitchet@nsf.gov
Lee Zia, Program Director, telephone: (703)292-5140, email: lzia@nsf.gov
NSF Contacts continued…

Physics/Astronomy
Joyce Evans, Program Director, telephone: (703)292-5098, email: jevans@nsf.gov
John Mateja, Program Director, telephone: (703)292-4641, email: jmateja@nsf.gov
Duncan McBride, Program Director, telephone: (703)292-4630, email: dmcbride@nsf.gov

Research/Assessment
Myles Boylan, Program Director, telephone: (703)292-4617, email: mboylan@nsf.gov
Connie Della-Piana, Program Director, telephone: (703)292-5309, email: cdellapi@nsf.gov

Social Sciences
Myles Boylan, Program Director, telephone: (703)292-4617, email: mboylan@nsf.gov
Connie Della-Piana, Program Director, telephone: (703)292-5309, email: cdellapi@nsf.gov

Frequently Asked Questions

SJSURF Website Link to TUES FAQs:

http://www.sjsufoundation.org/pdf/TUES.pdf
Writing Tips

- Write the proposal narrative with **review criteria** in mind.

- When proposing your idea, use the **same terms or descriptors** used in the **guidelines**. This will help reviewers connect your ideas to the criteria that they have been asked to identify and assess.

- Reviewers are typically fatigued when reading proposals, so you don’t want to make your proposal difficult to read; follow the **guidelines**!
Next Steps

- Notify your SJSURF Sponsored Programs Manager
- Identify the budget line items you will need
- Create a draft scope of work
- Ask your SJSURF Sponsored Programs Manager any questions you may have about the process or requirements
- Prepare to turn your documents over to your Sponsored Programs Manager by 5/19/10, if not sooner.
Schedule of Workshops

NSF I3 Web Conference-Tuesday-March 16, 2010
Location: SJSURF 4th Board Room
Time: 11:00 a.m. to 12:30 p.m.
RSVP by March 15

Focus on Post-Award – Monday – March 22, 2010
Location: MLK Library, Room 255-257
Time: 11:30 a.m. to 1:00 p.m.
RSVP by March 19

NSF Proposal Writing Workshop-Webinar
Tuesday March 30, 2010 1:00 pm EDT
Wednesday March 31, 2010 1:00 pm EDT
Tuesday April 13, 2010 1:00 pm EDT
Location & Time: More Information to Follow

NSF Project Evaluation and Broader Impacts-Webinar
Wednesday April 14, 2010 1:00 pm EDT
Thursday April 15, 2010 1:00 pm EDT
Location & Time: More Information to Follow

NIH AREA –Monday – April 12, 2010
Location: MLK Library, Room 255/257
Time: 11:30 a.m. to 1:00 p.m.
RSVP by April 8

Online Tools – Wednesday – May 5, 2010
Location: MLK Library, Room 255/257
Time: 11:30 a.m. to 1:00 p.m.
RSVP by April 30

Send RSVPs to Kristin Nwakobi: knwakobi@foundation.sjsu.edu
<table>
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<th>Post-Award Services</th>
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<tr>
<td><strong>Jerri Carmo</strong> 924-1429</td>
<td><strong>Lan Duong</strong> 924-1426</td>
<td><strong>Ricky Yoneda</strong> 924-1441</td>
</tr>
<tr>
<td>Deputy Chief Operating Officer, Office of Sponsored Programs Director</td>
<td>Associate Director</td>
<td>ESSP Supervisor</td>
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<td>Incubators</td>
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<td><strong>Jeanne Dittman</strong> 924-1434</td>
<td><strong>College of Business; Psychology</strong></td>
<td>MLML Ship Operations</td>
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<tr>
<td>Associate Director</td>
<td><strong>Shalaka Joag</strong> 924-1306</td>
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<td>Pre-Award Administration</td>
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<tr>
<td>MLML Ship Operations</td>
<td><strong>Steve Constantine</strong> 924-2170</td>
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<td><strong>Angela Mercado</strong> 924-1307</td>
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<td>SSP Analyst</td>
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<td><em>Meteorology and Moss Landing</em></td>
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<td><em>Marine Labs</em></td>
<td><strong>Kristin Nwakobi</strong> 924-1437</td>
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<td><strong>Lori Luddington</strong> 924-1427</td>
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<tr>
<td>College of Education, College of</td>
<td><strong>Nancy Riley</strong> 924-1305</td>
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<tr>
<td>Social Science, University Programs, Graduate Studies &amp; Research</td>
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<td><strong>Krisha De La Fuente</strong> 924-1546</td>
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<td><strong>Erin Romer</strong> 924-1440</td>
<td><strong>Jasmine Le</strong> 924-1433</td>
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<td>Moss Landing Marine Laboratories</td>
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<td><strong>Michele Vaccaro</strong> 924-1430</td>
<td>College of Education</td>
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<td>International &amp; Extended Studies</td>
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<td><strong>Diem Trang Vo</strong> 924-1432</td>
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"I think you should be more explicit here in step two."

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