

**The Third Tribal Colleges and University Engineering and Engineering Technology Education
Summer Institute**

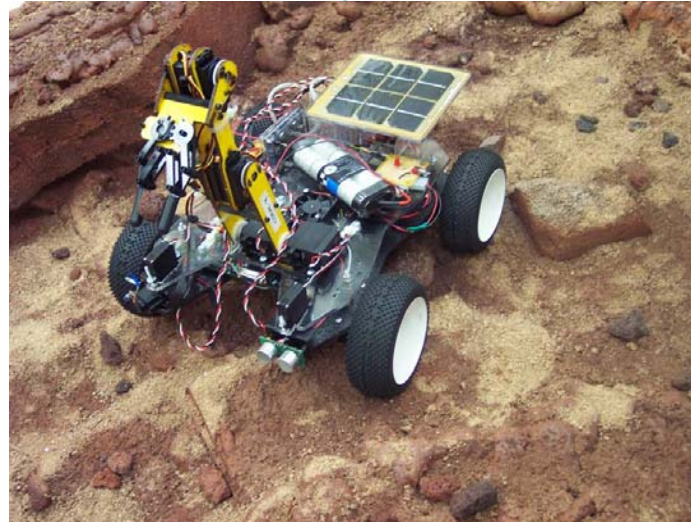
NASA-AIHEC Summer Research Experience (SRE) Program

Research Opportunities Program for Excellence (ROPE)

NSF ATE ASEET TCU Faculty Professional Development Program

NSF TCUP II Program

June 15 – July 25, 2009 - Southwestern Indian Polytechnic Institute (SIPI), Albuquerque, New Mexico



Department of Advanced Technical Education

Southwestern Indian Polytechnic Institute

Salish Kootenai College

Dine College

Oglala Lakota College

Little Big Horn College

The Third TCU's Engineering/Robotics Summer Institute

Summary

SIPI Engineering and Engineering Technology Programs, in collaboration with SIPI NSF TCUP II and NSF ATE ASEET Programs, NASA Johnson Space Center, and AIHEC will offer its Third TCU Engineering/Robotics Summer Institute on June 15-July 25, 2009. This year theme is Web-based Remote Control of Mobile Robotic Systems.

There will be three research and development Groups and a total of ten teams for summer 2009. The graduate students from UNM, NMSU, NMTECH, and students and faculty from Tribal Colleges (SIPI, SKC, Dine, OLC, and LBHC) will apply to join one of the three research groups, based on their interest. The work will fulfill the partial requirements for the ENGR 280 and ENGR 105 SIPI summer courses. This year Summer Institute is scheduled for six weeks of intensive workshops, courses, and research and development experience activities at SIPI and one week of visit to NASA JSC.

NASA-AIHEC SRE students should first apply to SIPI admissions office as "new student". Once they are accepted to SIPI summer school, they should sign up for the following courses to qualify as full-time (12 credit hours) SIPI students and eligible for dorm and cafeteria:

ENGR 105 1 Intro to Engineering & Design TTh 10:00-11:55 3 Vadiee ST141 MATH 100

ENGR 280 1 Engineering Internship TBA 3 Vadiee TBA

ENGR 285 1 Design Project TBA 3 Vadiee TBA Second Year Student

ENGR 290 1 Special Topics (Microprocessors/Microcontrollers) TBA 3 Vadiee TBA Second Year Student

Catalog Information for the Engineering Courses Offered:

ENGR 105 – Introduction to Engineering and Design (3)

Pre-requisite: MATH 100 or Instructor's permission. This course focuses on the systematic approach to problem solving required in engineering practice and discusses the traits of a successful engineer and the engineering design method. The students will have introductions to bridge building (civil engineering), robotics (electrical engineering) and fluid mechanics (civil and mechanical engineering).

ENGR 280 – Engineering Internship (3)

Pre-requisite: Second year standing in engineering and successful completion of all required non-elective 200-level engineering courses or successful completion of minimum required trimesters with a minimum cumulative GPA as required by the industry internship partner. This

course provides the qualifying student with an internship or on-the-job training for gaining related experience in the engineering industry at an approved industrial facility.

ENGR 285 – Design Project (3)

Pre-requisite: Second year standing in engineering and successful completion of all required non-elective 200-level engineering courses. Design methodology and development of professional project-oriented skills including communication, team management, and economics. Working in teams, a proposal for a large design is prepared in response to an industrial or in-house sponsor.

ENGR 290 – Special Topics (1-4 credits, unlimited repetition)

Pre-requisite: Second year standing in engineering, completion of all required non-elective 200-level engineering courses, and permission of instructor. This course covers new topics, trends, methodology, skills, practices, industry certifications, etc. of interest in engineering and engineering technology fields.

Management Plan:

The main focus of this year SRE is Capacity Building in terms of Course, Curriculum, and Lab. Development. The main theme is Remote and web-based control of a collaborative group of mobile robots. Our unit of activity is a team project. There are 8 team projects. Each team project faculty supervision and advisement is equivalent to 10 (weeks-June 1-August 7, 2009) X 6 hrs/week = 60 hours for the team project mentor is 15 weeks - (May 1-August 7, 2009) X 20 hrs/week = 300 hours), for interns is 10 weeks (June 1-August 7, 2009) X 20 hrs/week = 200 hours

Each faculty spends 4hrs/week working directly with the teams and 2hrs/week for preparation (James Hart, Vali Manavi, James Dunn, Olga Lavrova, Mike Majedi, Nader Vadiiee, and Dean Pershall).

Each mentor spends 20hrs/week total working with project teams (Mario Ortiz, Eric Johnson, Desiree Cordova, Rafael Peres)

SRE students need to enroll in 4 of the five courses: ICT 280 and ENGR 105, 280, 285, ENGR 290. SRE students choose to join two of the A1-A4 teams. Students choose to join 1-3 of these teams depending on their enrollment in ICT 280 and ENGR 105, 280, 285. If they are an NSF intern and not enrolled in any of the above courses, they choose two of A1-A3 or. If they are an NSF intern and enrolled in any of the above courses, they choose two of A1-A3 plus a team related to the enrolled course. The students are not paid for any team project that is a requirement for the course they are enrolled in.

ICT 280 8 students, ENGR 105 5 students, SRE 290 12 students, Interns 10 students, Mentors 4, Faculty 6, Staff 2 = Total 47

Rules

VIP Team Projects for SRE 2009

June 1- August 7, 2009

1. There will be 8 VIP team projects in three categories of R&D, E&O, and D&D.
2. Each team is comprised 1-2 faculty advisors, 1-2 mentors, 1 Team Leader, 3-5 project team members,
3. Faculty: Dr. Nader Vadiee, Dean Pershall, James Hart, Fabian Lopez, Pat Feather, James Dunn, Dr. Olga Lavrova, Vali Manavi (Dine College) , A.J. Silva (Oglala Lakota College)
4. Mentors: Eric Johnson (UNM) , Mario Ortiz (UNM), Desiree Cordova (NMSU), Rafael Perea (NMTECH)
5. SIPI Team Leaders: Alicia Montoya, Mike McGahey, Curtis Wilson
6. Each team is small business Engineering R&D Company.
7. Each company will be mock incorporated with bylaws and etc.
8. Each team will be paired with mentors and faculty.
9. Each team member needs to fill out an IC-MARS and NSF/ATE or NSF/TCUP applications.
10. Each team member becomes an active member of AISES.
11. Each team mentors three incoming SIPI freshman student.
12. Each team keeps a daily logbook and online journal.

13. Each team prepares a paper for NSF, AISES, AIHEC, or SACNAS conferences.
14. Each team submits a proposal.
15. Team Project schedule weekly meetings.
16. Team Projects Progress Reports every other Friday. (A proposal, three progress reports, one final report Poster, Oral, and Demo., A set of 12 Lesson plans/labs/activities/projects)
17. Each team will post a weekly schedule, team picture, and contact info.
18. Each intern joins at least two team projects. In addition, if they are enrolled in ENGR 105, or 280, or 285, or 290, join a team project for each course enrolled. Each intern spends 14 hours on two “ Team Project” activities , assignments , and team meetings. Each Intern, in addition, spends 6 hours giving tutoring and receiving tutoring for Math, science, and English, and computer classes.

Our unit of activity is a team project. There are 10 team projects. Each team project faculty supervision and advisement is equivalent to 10 (weeks-June 1-August 7, 2009) X 6 hrs/week = 60 hours for the team project mentor is 15 weeks - (May 1-August 7, 2009) X 20 hrs/week = 300 hours), for interns is 10 weeks (June 1-August 7, 2009) X 20 hrs/week = 200 hours

The teams are evaluated. The first place receives \$300/member, second place \$200/tmember, and third place receive \$150/member. All other ET and ENGR and IT students with a contract receive \$100/student. A final Demo and Presentation is required.

Team Projects (June 1 – August 7th, 2009)

A1- Environment: Yard, Geology, Audio, Video, and Data Devices and Controls, and Multi-Media Design, Green Screen, Stage Set-up, Mission Control Room Nader Vadiee (PI-SIPI-SRE) , A.J. Silva (Faculty-OLC-SRE) , Vail Maanavi (Faculty-DINE-SRE) , James Dunn (Program Manager/Faculty-SIPI-SRE) , Rafael Perea (Mentor-NSF-NMTECH-NSF), Curtis Wilson(Team Leader Intern-SIPI-TCUP)

A2 - Web-based Command, Control, Communication and User Interfaces Robotics: James Hart (Faculty-SIPI-SRE), Fabian Lopez (Faculty-IF-SRE), Eric Johnson (Mentor-UNM-ATE), Desiree Cordova (Mentor-NMSU- ATE), James Dunn (Program manager/Faculty-SRE), Mike McGahey (Team Leader-Intern-SIPI-ATE), Alicia Montoya (Intern-SIPI-NSF/ATE), Raelene Denny (INTERN-SIPI-TCUP), William Day (Intern-SIPI-TCUP) , Glencole Billie (Intern-SIPI-TCUP), Tierney Yazzie (Intern-SIPI-ATE), Kesha Holder (Intern-Dine-SRE), Kesha Holder (Intern-Dine-SRE) , Lionel Gros Ventre (Intern-LBHC-SRE) , Patrick White (Intern-OLC-SRE) , Beau White Cow Killer (Intern-OLC-SRE), Michael DuBray (Intern-OLC-SRE) , David Herman (Intern-OLC-SRE)

A3- Mobile Robot Platforms- RoadRunner, CoroWare, Lynxmotion, IROBOT, PACBOTS, RUMBA, LEGO-NXT, C_Stamp: , Pam Feather (Faculty-IF-SRE), Eric Johnson (Mentor-UNM-NSF/ATE), Desiree Cordova(Mentor-NMSU-NSF/ATE), Alicia Montoya (Team Leader-Intern-SIPI-NSF/ATE), Glencole Billie (Intern-SIPI-TCUP), William Day (Intern-SIPI-TCUP) , Tierney Yazzie (Intern-SIPI-ATE), Kesha Holder (Intern-Dine-SRE), Kesha Holder (Intern-Dine-SRE) , Lionel Gros Ventre (Intern-LBHC-SRE) , Patrick White (Intern-OLC-SRE) , Beau White Cow Killer (Intern-OLC-SRE), Michael DuBray (Intern-OLC-SRE) , David Herman (Intern-OLC-SRE)

A4 - Web-based /Wireless Data Collection and SCADA system for on-campus Renewable Energy Projects Olga Lavrova (Faculty-UNM-SRE) , Hart (Faculty-SIPI-SRE) , Mario Ortiz (Mentor-UNM-ATE), Martin Grace (Team Leader-Intern-SIPI-TCUP), Reginald Overton(Intern-SIPI-TCUP) , Marco Pablo (Intern-SIPI-TCUP) , Curtis Wilson(Team Leader Intern-SIPI-TCUP), Jason Thomas (intern-SIPI-TCUP)

B1 - Universal Solar Charger, Rovers Solar Chargers, Green Building. : Olga Lavrova (Faculty-UNM-DoEd.), A.J. Silva (Faculty-OLC-SRE) , Pam Feather (Faculty-IF-Mario Ortiz (Mentor-UNM-TCUP), Vali Maanavi (Faculty-Dine-SRE), Fabian Lopez (Faculty-IFF/CNM-SRE), Martin Grace (Team Leader-Intern-SIPI-TCUP), William Day (Intern-SIPI-TCUP), Curtis Wilson(Intern-SIPI-TCUP) , Jason Thomas (intern-SIPI-TCUP)

B2- Machine and Manufacturing Labs, Boxes, BobCAD, Laser Cutters, promotional items, Robot parts: James Dunn (Program manager/Faculty-SRE), Abe Gurule(Mentor-BHS-SRE), Jason Thomas (Team Leader-intern-SIPI-TCUP), William Day (Intern-SIPI-TCUP)

C1 - IT Support, video conferences, and System Admin.: James Dunn (Program manager/Faculty-SRE), Raelene Danny (Team Leader-Intern-SIPI-TCUP), Mike McGahey (Intern-SIPI-ATE), Joseph Hernandez (Intern-SIPI-TCUP)

C2 - Documentation and Dissemination -James Dunn (Program manager/Faculty-SRE), Rolonda Yazzie (Staff-SIPI-NSF), Rafael Perea (Mentor-NMTECH-NSF), Evelena McGahey (Assistant Program Manager -SIPI-SRE), Christina Grace (Intern-SIPI-TCUP), Cecelia Haldane (Intern-SIPI-TCUP), Angelo Robledo (Intern-SIPI-Work Study)

Robotics Summer Institute

Weekly Schedule (Summer 2009)

June 15 – July 25, 2009

Hour	MON	TUE	WED	THU	FRI
8-9	Interns Meeting	Staff Meeting	Interns Meeting	Staff Meeting	Activities
9-10	ENGR 290 Special Topics	ENGR 105 Class ST 141	ENGR 290 Special Topics	ENGR 105 Class ST 141	Activities
10-11	ENGR 290 Special Topics	ENGR 105 Class ST 141	ENGR 290 Special Topics	ENGR 105 Class ST 141	Activities
11-12	ENGR 290 Special Topics	ENGR 105 Class ST 141	ENGR 290 Special Topics	ENGR 105 Class ST 141	Activities
12-1	Break	Break	Break	Break	Break
1-2	Break	Break	Break	Break	Break
2-3	ENGR 285 Design Project Class	ENGR 280 Engineering Internship Class	ENGR 285 Design Project Class	ENGR 280 Engineering Internship Class	Break
3-4	ENGR 285 Design Project Class	ENGR 280 Engineering Internship Class	ENGR 285 Design Project Class	ENGR 280 Engineering Internship Class	Break
4-5	ENGR 285 Design Project Class	ENGR 280 Engineering Internship Class	ENGR 285 Design Project Class	ENGR 280 Engineering Internship Class	Break

GOALS & EXPECTATIONS:

1 – Academic Excellence and GPA

2 – Research Experience

3 – Course, Curriculum and Lab. Capacity Building

4 – Simulated #Exploration of Mars – SIPI Indoors and Outdoors Mars Yard

5 – Outreach, mentoring, tutoring for the recruitment of new students

6 – Team weekly schedules and minimum commitment of time and portfolio's

7 – Project Team members Daily logs, weekly meeting, bi-weekly progress report, and final report.

8 - Team C and Support for other teams

9 – Professional Behavior and after hours work

10 – Safety, security and conservation and protection of resources

Each Intern will join a minimum of two teams (2 teams X 7 hours/team/week = 14 hours/week)

Each Intern will offer or receive a minimum of 6 tutoring hours.

NASA AIHEC SRE students are required to join two teams from the A2, A3 group.

All team activities are scheduled for afternoon, 1:00 – 5:00 pm and some morning hours.

NASA AIHEC SRE students are required to attend the ENGR 290 and ENGR 105 lecture courses held M-TH , 9:00 am – 12:00 pm .

All teams are required to submit their team portfolio's (Contact info. weekly schedules, pictures, ICMARS applications, TCUP, ATE applications, contracts, parts lists, progress reports, final report).

NASA/AIHEC states that every 2 weeks that everyone paid will provide a biweekly timesheet, a biweekly report, and a daily log of activities. There were no exceptions listed. Also required are written and oral components at the end.

A gross summary (two paragraphs) is all that is needed for each project to fulfill the bi-weekly report. Use your Daily Log to compose the Biweekly Report.

Project A - Paragraph 1 - what I was tasked with for the past 2 weeks
- Paragraph 2 - what I accomplished and learned for the past 2 weeks

Project B - Paragraph 1 - what I was tasked with for the past 2 weeks
- Paragraph 2 - what I accomplished and learned for the past 2 weeks

Tutoring - Paragraph 1 - Subjects of Tutoring (reports, core classes, technology...)
- Paragraph 2 - Who was involved

If you let your grades drop, you will be disenrolled as an Intern (and may not be able to return), so make sure you get sufficient tutoring to keep your grades up. You are expected to study and do your homework after working hours. But tutoring allows you to spend less time studying and doing homework. It is always easier if you understand the material before you do your homework; see a tutor before attempting to do homework to discuss the concepts. Do the easy problems quickly. Then go back to the Tutor to help you figure out the difficult problems. Don't let the tutor do the problem for you, it won't help you during exams.

Six (6) hours are assigned to each Intern for tutoring, every week.

Since it only takes a half an hour to write a bi-weekly report during the tutoring hours, this should not impact the Project tasks assigned by the Team Leaders.

Writing is an important component of working professionally. These are opportunities to learn to write clearly and concisely. The purpose of these programs is to encourage scholastic growth, if a team member is timid about writing; this is a fear that must be overcome. Any fear is overcome through understanding, and practice promotes understanding.