

INSIGHT: A GK-12 STEM Fellowship Program at Kansas State University

Program Handbook

2013-2014

About INSIGHT

Infusing System Design and Sensor Technology in Education (INSIGHT) focuses on integrating sensor technology with computing and information science in standards-based science, technology, and engineering curricula and instruction. Project activities will team GK-12 STEM Fellows with science, technology and physical education teachers through summer and academic year activities in the classrooms of rural Kansas schools.

Overall Project Goals

- To enhance the usefulness, practicality and relevance of sensor, computing, and information technology education by linking research for Fellows to science and technology curriculum and to practice for classroom teachers.
- To support technology in rural Kansas through two of the most important aspects impacting rural life: agriculture and health care.
- To improve health awareness and practice through human sensor data.
- To improve the teaching and learning of technology and engineering design in elementary, middle school and high school classrooms by experiencing the interrelationships between deductive reasoning, inquiry and algorithmic problem solving through the integration of sensor technology and computing in the curriculum.
- To create a community of learning, teaching and mutual support between the higher and pre-college education participants from rural and Hispanic backgrounds.

Project Activities

- A Summer Institute will provide GK-12 STEM Fellows with training in hands-on sensor-driven science, engineering, and technology development, Kansas Curriculum Standards, and classroom instruction methodology.
- A Summer Institute will provide participating teachers with two weeks of training and orientation focusing on sensor technology, computing and information science topics, selected science and technology content areas and the use of the appropriate pedagogical and assessment strategies.
- During the academic year, GK-12 STEM Fellows will support participating teachers within the classroom up to five hours per week in their area with content-specific sensor technology and computing and information sciences.
- Program staff will provide semester-long professional development opportunities via guided research and investigations of practical applications of technology integration in the field and within the classroom.
- Weekly meetings between project staff and GK-12 STEM Fellows and monthly meetings between project staff and GK-12 Partner teachers will provide investigators, teachers and fellows with feedback.

Fellows

Working with Partner Schools

The primary responsibility of INSIGHT Fellows is to provide technological expertise and knowledge of current research to their partner's schools. This typically takes the form of hands-on lessons presented in the classroom environment, but this is not the only possible means - past fellows have done team-teaching activities, field trips, one-on-one tutoring, and assisted with after-school programs.

Teacher Partnerships

You will be partnered with two K-12 teachers. These teachers are to be your partners – while you have specialized knowledge in your field to contribute, these teachers are experts at instructing students and can provide you with much support in both planning and executing lessons. Teachers are also constrained by educational standards and expected student outcomes, so you will need to work extensively with them to ensure that your efforts mesh well with their classroom goals.

Time Commitments

The GK-12 grant expects GK-12 Fellows to spend 15 hours a week on program activities. For INSIGHT, this ideally consists of an average of 5 hours a week in each partner teacher's classes – time spent working directly with students. This interaction can be face-to-face, or managed through distance technology, like the Zoom video conferencing system provided by Kansas State University. The remaining five hours should be spent on planning activities, both solo and in conjunction with your partner teachers.

Lesson Development

An important aspect of the GK-12 Program is developing lesson materials that can be disseminated to a wider audience than just your partner school. To this end, we are posting lesson plans to the INSIGHT webpage. Fellows (and teachers) are encouraged to post possible lesson ideas to the "Lesson Ideas" section of the site to help promote discussion and planning. Additionally, fellows are required to post no less than four complete lesson plans to the INSIGHT page.

Professionalism

Remember that you are representing Kansas State University and your respective departments and professions. Bear yourself well, be careful of your language, and dress appropriately (your partner teachers can help you understand what dress is appropriate for their school - and remember it is always better to dress up than down). Additionally, you will be a role model to the students you work with - so please make sure that you provide the best role model you can.

Travel to and From Schools

Fellows will also be reimbursed for travel expenses to and from partner schools, according to the rates set by the State of Kansas. The mileage rate is currently \$0.51 per mile. Fellows wishing to be reimbursed for their travel expenses must submit the details of their trip through the travel form available on the Project INSIGHT website in a timely manner. Reimbursements will be collected into a single monthly payment.

Equipment and Supplies

Many lessons will require the use of specialized equipment or supplies that may not be available to your partner schools. The INSIGHT grant does have some funds set aside for such purchases, and the Department of Computing and Information Sciences is willing to leverage other funding sources as well to ensure that INSIGHT has the equipment it needs.

In addition, many supplies have already been purchased by the program, including WiiMotes, Bluetooth dongles, USB Drives, Garmin Forerunners, and Garmin ETrex GPS Units. These are maintained as a shared pool of equipment for the Fellows to check out for use with a partner school.

Details on currently purchased equipment can be found in the “Equipment” section of the INSIGHT website. Reservations for needed equipment can also be made through the website.

Additional equipment purchases need to be arranged through the Project Coordinator (Nathan Bean). Kansas State has a strict purchasing policy that needs to be adhered to. Purchased equipment normally remains with the INSIGHT program.

Kansas State Graduate School

A Fellow is first and foremost, a graduate student. While your time commitments to the INSIGHT Program are important, so are your studies. An INSIGHT Fellow is expected to maintain good academic standing and make steady progress towards achieving their degree.

Enrollment

As a GK-12 Fellow, you are required to be a full-time student. At K-State, this means enrolling in a minimum of six credit hours for the Spring and Fall semesters. Summer enrollment is optional. You are required to provide a list of the classes you intend to take to the Program Coordinator (Nathan Bean) at least two weeks before the term begins. This allows us to prepare the necessary paperwork to reimburse your tuition and purchase your textbooks.

Maximum Credit Hours

You may take up to nine credit hours a semester while working as a GK-12 STEM Fellow in the INSIGHT Program. Enrolling in more hours may impact your ability to perform your INSIGHT responsibilities, and must be approved by the Program Director (Mitch Neilson).

Tuition

The INSIGHT grant pays for in-state tuition and fees, and the Graduate School additionally pays for any out-of-state tuition and fee differences. To ensure that your tuition is covered, you must submit your list of enrolled courses at least two weeks prior to the beginning of term to the Program Coordinator (Nathan Bean).

Textbooks

Project INSIGHT will also provide textbooks for your course. The list of courses taken (and any textbooks your professors require but have failed to make available through the Varney's Bookstore public listings), need to be turned in to the Program Coordinator (Nathan Bean). Textbooks will be available for pickup at the CIS front office (Nichols 234) as soon as they have been purchased.

Graduate Program Requirements

In addition to your responsibilities to the INSIGHT Program, your graduate program may have additional responsibilities and requirements for their students. As an INSIGHT Fellow, you must also maintain good standing with your graduate program - which means meeting any additional expectations that program holds for you. Your graduate program Advisor will inform you of what expectations your individual program has.

Other Responsibilities

In addition to your efforts with your partners schools and your coursework, there are several more requirements for INSIGHT Fellows.

Summer Institute

Fellows are required to participate in the two-week INSIGHT Summer Institute held at Kansas State University, which is detailed below. Students will be responsible for their own housing during the Institute, but lunches will be provided Tuesday, Wednesday, and Thursday of each week.

Evaluation Participation

You will also be asked to complete several surveys and interviews over the course of your participation in the INSIGHT Program, as well as enter monthly journal entries on the INSIGHT website. We cannot emphasize enough the importance of these evaluation activities - the National Science Foundation uses the collected data to evaluate the success or failure of their programs. Any lack of participation reflects badly on Kansas State and can harm our chances at securing future grants, and therefore providing useful services to the State of Kansas.

Weekly Meetings

Fellows meet weekly during the academic year. These provide a chance to explore topics of interest to the program, as well as facilitating interaction between Fellows, including the sharing of ideas, critiquing of lessons, and also handling any issues that may have arisen in the previous week.

Program Benefits

INSIGHT provides a number of benefits for its fellows, including an annual stipend, health insurance, and the opportunity to attend conferences.

Stipend

Fellows receive a \$30,000 stipend per year. This is paid out in monthly increments of \$2,500. Please note that you are paid only once per month, so careful management of your funds will be crucial. This is a stipend, not a regular payroll check, due to the structure of the grant. K-State will therefore not withhold taxes from your stipend checks, nor issue a 1099-MISC to the Fellows. However, the IRS may consider the stipend to be taxable income, and Fellows are responsible for payment of any taxes owed. You may wish to consult with a tax professional to help determine tax liability and how to make estimated tax payments if needed (the following website may also be useful: <http://www.irs.gov/publications/p970/index.html>).

Conference Attendance

Dependent on available funds, Project INSIGHT may reimburse fellows for travel, meals, and registration fees for attending appropriate conferences.

Health Insurance

Project INSIGHT also provides health, dental, and vision insurance for those students who desire it. Health insurance is provided through United Health Group Incorporated. Fellows must re-enroll in the program every semester (Fall, Spring, and Summer) by making an insurance request at: http://gk12.cis.ksu.edu/insurance_requests/new

Housing

Fellows are responsible for their own housing arrangements. As graduate students, fellows are eligible for on-campus housing - see the Housing and Dining services website (<http://www.housing.k-state.edu/>) for details. Both Residence Halls and Jardine Apartments are available to Fellows. Be aware that university housing may not be available during breaks, depending on your contract.

Recreational Services

As Kansas State Students, Fellows also have access to the Peters Recreation Center and the Natatorium (K-State Pools).

Employment Status

One final, important note - GK-12 Fellows are not employees of Kansas State University. Rather, they are graduate students receiving a stipend which is tied to their performance within the INSIGHT Program. Thus, Fellows are not eligible for employee benefits. Fellow health insurance is student insurance paid for by the INSIGHT Program (See the Health Insurance section above). Also, no tax is withheld from the Fellow's stipends - Fellows are responsible for any tax liability they may incur from this stipend income (see the Stipend section above).

Teachers

Working with Your Fellow

It may be difficult to figure out just how to fit your fellow into your classroom environment, as they don't fit neatly into any of the categories you are probably used to - they aren't a partner teacher, and they aren't a student teacher. They have no formal education training, hold no teaching certifications. It may be best to consider them an "outside expert".

Mentoring

One of the most important responsibilities you have is helping your partner Fellow develop into an effective communicator. Remember, most of the Fellows have no classroom experience, and while they will be very knowledgeable in their discipline, they may find working with your students an overwhelming experience. Helping them to learn strategies for effective interaction with your students will help them to better bring their knowledge to bear and benefit your students. While your Fellow is working towards becoming an expert in his field, you already are an expert in yours, and they can benefit greatly from your expertise.

Lesson Planning

Another skill your fellow will likely lack is an understanding of lesson planning. As you well know, lesson planning is often more of an art than a science, and preparation is often the difference between a successful and failed lesson. Please lend your expertise in this difficult art to your fellows. Understanding the importance of timing, structure, and preparation are skills that will serve them well, even outside of the classroom.

In addition, help your fellows to understand the curriculum and Standards that you are working under, and work with them to see how their efforts can contribute to integrating with your curriculum and meeting those Standards. In many cases this may require "out of the box" thinking - but the benefits of tying real-world applications to the lessons you are presenting can help raise your students' interest level significantly.

We anticipate that several hours a week will need to be spent planning with your Fellow. This time need not be face-to-face, email, Skype, and phone conversations are all acceptable.

Time Commitments

We are asking the Fellows to spend an average of five hours in face-to-face interaction with your students. This may initially seem excessive, especially considering the tight curriculum constraints you are operating under. But not all of this time needs to be spent presenting lesson materials - your Fellow can also act as an “Outside Expert” reinforcing the materials you are already covering, tutor students in their discipline subjects, work with after-school, special needs, and other programs. They may also work with other classes in your school, if you are willing to serve as a facilitator.

Understanding Limitations

A crucial understanding you must have is that your Fellow is not a certified teacher or student teacher. Please do not leave your Fellow alone with students - they have not been vetted by the State and are not prepared for that kind of responsibility.

Additional Commitments

In addition to working with your Fellow, by participating in the INSIGHT program, you agree to several other conditions.

Summer Institute

Project INSIGHT holds a two-week Summer Institute. This institute is detailed in its own section below. Teachers are expected to actively participate in the Summer Institute. Housing will be provided for those Partner Teachers from outside of the Manhattan area, as will meal reimbursement. Mileage will also be reimbursed (at a rate of \$0.51 per mile) for all traveling Partner Teachers, and lunches will be provided for Tuesday, Wednesday, and Thursday.

Evaluation Participation

You will also be asked to complete several surveys over the course of your participation in the INSIGHT Program, as well as enter monthly journal entries on the INSIGHT website. While these evaluation activities may seem unnecessary, we cannot emphasize their importance - the National Science Foundation uses the collected data to evaluate the success or failure of their programs, and lack of participation reflects badly on Kansas State and can harm our chances at securing future grants, and therefore providing useful services to the State of Kansas.

Monthly Meetings

Teachers are also asked to participate in monthly meetings that will be held using the Zoom video conferencing system. These meetings are to help the program ensure it is providing the

best quality experiences to your students by allowing cross-pollination of ideas and providing a forum for discussion of any issues that may have arisen in the previous month.

Program Benefits

Project INSIGHT provides a number of benefits to Partner Teachers, including an annual stipend, the possibility of attending conferences, housing and meals during the Summer Institute, access to specialized equipment, and continuing education credits.

Stipend

Teachers are paid a \$5,000 stipend, distributed in two checks. The first \$4,000 will be issued upon successful completion of the Summer Institute, and the remaining \$1,000 will be paid midway through the academic year providing the teacher has fulfilled their responsibilities.

The IRS may consider this stipend to be taxable income. You may want to consult with your tax professional to determine possible tax liability and how to make estimated tax payments if needed.

Conference Attendance

Dependent on available funds, Project INSIGHT may send Partner Teachers to appropriate conferences. INSIGHT will reimburse travel expenses, lodging, and registration expenses, as well as providing Per Diem for meals.

Access to Equipment

The INSIGHT Program will also provide specialized equipment necessary to support the Fellow's efforts in your classroom. Most of this equipment will be "on loan," but there is a possibility of ceding some equipment to the partner school as well, depending on the availability and source of funds.

Continuing Education Credits

Project INSIGHT has arranged, through the Department of Education at Kansas State, to provide continuing education credits to interested Partner Teachers who have attended the Summer Institute. The tuition and fees for this course are paid through INSIGHT grant funds.

Summer Institute

The INSIGHT Summer Institute will be held June 3-7 and 10-14. We begin Mondays at 1p.m. and end Fridays at 12p.m. to allow time for those who need to travel. All other days will begin at 8:30 a.m. and run until 4:30 p.m.

Preparation

Teachers and fellows are encouraged to bring any questions they may have with them. Teachers should also bring any curriculum planning materials they use. Everyone will benefit from note-taking equipment (pad and paper or a laptop).

Several days will have activities that take place outdoors, so you are encouraged to bring comfortable clothes and sturdy shoes, as well as any sunscreen and insect repellent you may need. Long pants and close-toed shoes are required for the K-State Challenge course.

Participation

Please note that the INSIGHT Summer Institute isn't just a series of lectures and presentations as many conferences are, but rather involves hands-on participation for many of the scheduled activities. Discussion is actively encouraged! Teachers and Fellows from our first year of the program will be leading many of the sessions, including presenting lessons that were developed during the previous year. New teachers and fellows will develop a lesson over the course of the two-week period and present it on our final Thursday.

Agenda

Following is the current agenda for the 2013 INSIGHT Summer Institute. A more detailed schedule will be provided at the Institute itself.

Week 1

Monday, June 3 - Welcome

- Introductions
- Pre-Institute Survey
- The INSIGHT Program & Breakout Sessions
- Reflections Slideshow
- Welcome Reception

Tuesday, June 4 – Team-building and Scratch Programming

- Petals around a Rose
- K-State Challenge Course (*The challenge course is located outside in a wooded region. We recommend comfortable clothing, long pants, sunscreen, insect repellent, and close-toed, sturdy footwear.*)
- Scratch Programming
- Using Scratchboard

Wednesday, June 5 – Sensors in the classroom

- NXT Robots and programming
- Global Positioning System
- Geocaching
- Moisture sensors

- Garmin GPS Watches
- Google Earth and post-processing GPS data
- Augmented Reality Head Tracking
- Common Core and Next Generation Science Standards
- Fellows introduce their research

Thursday, June 6 - Biological and Agricultural Engineering Day

- Soil Testing Lab Tour / BAE Advanced Projects tour
- Sediment Sensor and Soil Moisture Sensor
- Phenotyping
- Wireless Sensor Networks
- Wireless Sensor Field Trip
- Data Acquisition with LabView

Friday, June 8 - Educational Considerations

- Diversity in the Classroom
- Classroom Demographics
- Planning Time

Week 2

Monday, June 10 - Lesson Design

- Designing Lessons
- Lesson Planning Time
- Using the INSIGHT website
- Dynamic Environment Monitoring with Crossbow Motes

Tuesday, June 11 - Sensors and Platforms

- Ethics and Professionalism in the Classroom
- Sensors and Gaming Software
- WiiMote Physics Module
- Scratch Board and S4A
- Droid Applications
- Zoom Demonstration & Practice
- Parallel Programming & the Beocat Computing Cluster
- Lesson Development

Wednesday, June 13 - New Teacher/Fellow Presentation Day

- Fellow Presentations with Feedback
- Kinect 3D
- Lesson Planning Time
- Squishy Circuits Module
- Brainstorming

Thursday, June 14 - Konza Prairie Day

- *Activities take place on the Konza Prairie - we recommend long pants, sunscreen, insect repellent, and sturdy footwear*
- Learning about sensors used in environmental research
- Cyberethics/Cybersecurity
- EMG Sensors

Friday, June 15 - Wrap-Up

- Module Idea Presentations
- Post-Institute Survey
- Logistics Planning Session
- Packing Time