

**N446 Advanced Techniques in 3D
Section | 27591, IT 255, 3 CR**

**Department of Media Arts and Science / Human-Centered Computing /
Indiana University School of Informatics and Computing, Indianapolis
Spring 2017**

Section No.: 27591 *Credit Hours:* 3
Time: Mondays 3:00 -5:40
Location: IT 255, Informatics & Communications Technology Complex
535 West Michigan Street, Indianapolis, IN 46202 [\[map\]](#)
First Class: Jan 9th, 2017

Instructor: Zebulun Wood, MS in Technology, Lecturer
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TA: First Name Surname, Highest Degree in Major, Academic Title
Office Hours: Weekday, Hour range, or by Appointment
Office: WK #### *Email:* email@iupui.edu *Phone:* (###) ###-####

Prerequisites: N440 or instructor approval

Course Description:

Advanced topics in 3D such as but not limited to dynamics simulations (particles, clothing, hair and fluids) paint effects and rendering them realistically, MEL/python scripting, matchmoving techniques, and completing an entire shot from inception to completion as well as pipeline integration.

Graduate Cross-listing

This course is a cross listed course with both undergraduate and graduate students. Expectations from week to week will differ for each level of student. Graduate students are often requested to implement double the work as undergrads, research new problems and summarize solutions to problems to their undergraduate peers.

Required Text:

There are no required texts for this course.

Digital Tutors Account – <http://www.digitaltutors.com>

Equipment needed:

- Notebook
- Portable Hard Drive (250mb or higher) [flash drives not recommended]
- IU Box Account [<http://box.iu.edu/>]

Software used:

At school

Autodesk Maya
Nuke
Adobe Production Suite
Unreal/Unity

Currently not at school

Open VDB
Houdini
Krakatoa, Realflow, FumeFX

Teaching and Learning Methods

The course structure is composed of these parts:

- Lectures / Lab
 - This activity will be the majority of class time. It will include critical review of contemporary media as appropriate to class. Use of software packages to implement concepts into practice.
- Projects:
 - Weekly tasks will be assigned for each student.
 - Students MUST have their work completed weekly for credit in this class. Weekly assignment sheets will be collected for use in assessing student work.
- Canvas based Critique
 - A large portion of assessment will be weighted on student ability to critique peers weekly in and outside of class

Learning Outcomes:

| Upon completion of this course, the student will | *RBT | PUL | Assessment |
|--|-------|---------------|---------------------------------------|
| 1. Students develop, discuss, and implement from preproduction, to production, to post production of dynamics simulations for film or CG cinematic | 3,4,5 | 1a,1b, 2, 3,4 | Weekly, Section and Final Assignments |
| 2. Students will explore, create, experiment, and iterate visual effects | 5,6 | 2,3,4 | Weekly, Section and Final Assignments |
| 3. Students will create an advanced composite including several dynamics simulations for film or CG cinematic. | 6 | 2,3,4 | Section and Final Assignments |
| 4. Students will execute matchmoving, simulation, caching, and rendering pipelines | 6 | 2,3,4 | Weekly, Section and Final |

| | | | |
|---|-------|---------|---------------------------------------|
| | | | Assignments |
| 5. Students will deliver dynamics for film, game and short story projects as well as scientific simulation productions. | 6 | 2,3,4 | Weekly, Section and Final Assignments |
| 6. Students will interpret applications, requirements, and standards for visual effects pipelines | 4,5,6 | 2,3,4 | |
| 7. Students will develop sound vocabulary and eye to analyze, evaluate, and present and critique projects both online and in classroom. | 4,5 | 1A, 1C, | Weekly Discussion |

RBT: Revised Bloom's Taxonomy; PULs: Principles of Undergraduate Learning

Principles of Undergraduate Learning (PUL):

Learning outcomes are assessed in the following areas:

- 1A. Core communication: written, oral and visual skills (moderate)
- 1B. Core communication: quantitative skills
- 1C. Core communication: information resources skills (moderate)
2. Critical thinking
3. Integration and application of knowledge (major)
4. Intellectual depth, breadth, and adaptiveness (major)
5. Understanding society and culture
6. Values and ethics

Course Outcomes:

Students will develop a set of miniature projects over the course of the semester in advanced areas of 3D production dealing with dynamics and its implementation into various pipelines such as film, CG cinematic, or video games.

EXPECTATIONS, GUIDELINES, AND POLICIES

Attendance:

A basic requirement of this course is that you will participate in all class meetings, whether online or face-to-face, and conscientiously complete all required course activities and assignments. Class attendance is required for classroom-based courses. It entails being present and attentive for the entire class period. Attendance shall be taken in every class. If you do not sign the attendance sheet while in class, you shall be marked absent. Signing the attendance sheet for another student is prohibited. The instructor is required to submit to the Registrar a record of student attendance, and action shall be taken if the record conveys a trend of absenteeism.

Only the following are acceptable excuses for absences: death in the immediate family (e.g. mother, father, spouse, child, or sibling), hospitalization or serious illness; jury duty; court ordered summons; religious holiday; university/school coordinated athletic or scholastic activities; an unanticipated event that would cause attendance to result in substantial hardship to one's self or immediate family. Absences must be explained with the submission of appropriate

documentation to the satisfaction of the instructor, who will decide whether missed work may be made up. Absences that do not satisfy the above criteria are considered unexcused. To protect your privacy, doctor's excuses should exclude the nature of the condition and focus instead on how the condition impacts your attendance and academic performance.

Missing class reduces your grade through the following grade reduction policy: You are allowed two excused or unexcused absences. Each additional absence, unless excused, results in a 5% reduction in your final course grade. More than six absences result in an F in the course. Missing class may also reduce your grade by eliminating opportunities for class participation. For all absences, the student is responsible for all covered materials and assignments.

Incomplete:

The instructor may assign an Incomplete (I) grade only if at least 75% of the required coursework has been completed at passing quality and holding you to previously established time limits would result in unjust hardship to you. All unfinished work must be completed by the date set by the instructor. Left unchanged, an Incomplete automatically becomes an F after one year. <http://registrar.iupui.edu/incomp.html>

Deliverables:

You are responsible for completing each deliverable (e.g., assignment, quiz) by its deadline and submitting it by the specified method. Deadlines are outlined in the syllabus or in supplementary documents accessible through Canvas. Should you miss a class, you are still responsible for completing the deliverable and for finding out what was covered in class, including any new or modified deliverable. In fairness to the instructor and students who completed their work on time, a grade on a deliverable shall be reduced 10%, if it is submitted late and a further 10% for each 24-hour period it is submitted after the deadline.

Week 1:

INTRODUCTION

SYLLABUS

SECTION ASSIGNMENTS AND FINAL ASSIGNMENT BRIEF

ASSIGNMENT – Place 3 Film and VFX Breakdowns on Canvas Forums for review and discussion

Week 2:

CRITIQUE

LECTURE/DEMO: NParticles Overview

LAB

ASSIGNMENT: NParticles: Create a Render able wind, twister, or violent rain. 10 seconds due Week #4

Week 3:

CRITIQUE

LECTURE/DEMO: NParticles in Application(s)

LAB:
ASSIGNMENT Work on NParticles Assignment

Week 4:

CRITIQUE

LECTURE/DEMO: Review NParticles Section Assignment Soft and Rigid Dynamics With Nucleus Node Overview

LAB

ASSIGNMENT Create Physics based simulation, One Rigid body, and one soft body simulation. 5 second each. Due Week #6 A Playblast is sufficient.

Week 5:

CRITIQUE

LECTURE/DEMO: Soft and Rigid Dynamics Application(s)

LAB

ASSIGNMENT Work on Dynamics assignment

Week 6:

CRITIQUE

Review Soft/Rigid Body Dynamics Section Assignment

LECTURE/DEMO Hair Dynamics Overview

LAB

ASSIGNMENT: Using Hair Dynamics create a working Head of Hair, and simulate. 5 seconds of simulation only. This could be on a sphere, or better, a character. Due week #8 A render is required.

Week 7:

CRITIQUE

LECTURE/DEMO NHair Application(s)

LAB:

ASSINGMENT Work on NHair Assignment

Week 8:

CRITIQUE

Review NHair Section Assignment

LECTURE/DEMO NCloth Overview

LAB

ASSIGNMENT Using NCloth Simulation and dynamics create a real working example. 5 seconds of simulation only. This could be a flag, pile of clothes, clothes on a character etc.

A Render is required. Due Week #10

Week 9:

CRITIQUE

LECTURE/DEMO Cloth Application(s)
LAB
ASSIGNMENT Work on NCloth assignment

Week 10:

CRITIQUE Review NCloth Assignment
LECTURE/DEMO Fluids Overview
LAB
ASSIGNMENT Final introduction, Last day for proposals to be accepted week #11

Week 11:

CRITIQUE Proposals for Finals presented and dissected for solutions
LECTURE/DEMO Fluids Applications
LAB
ASSIGNMENT Work on Fluids assignment and Final

Week 12:

CRITIQUE Review Fluids Assignments
LECTURE/DEMO 3D Camera Tracking integration for Film compositing Visual Effects
LAB
ASSIGNMENT 3D Tracking Assignment continue to work on final

Graduate Research Assignment Literature review:

Choose one of the following problems to research, implement (proof), and present in the final weeks of the course:

- 1. Creating script based GUI's using Python or Melscript*
- 2. Implementing Clothing and Hair Dynamics after Character Animation*
- 3. Using Motion Capture Data to create foundational animations for both Maya and Game engines with Motion Builder*
- 4. Implement Muscle Based Dynamics into Rigs inside of Maya*

Week 13:

CRITIQUE
LECTURE/DEMO 3D Tracking Review, Rendering Review, Compositing Review
LAB
ASSIGNMENT Work on Final, begin render prep

Week 14:

ALL LAB DAY:
ASSIGNMENT Work on Final, begin render prep

Week 15:

ALL LAB DAY:

ASSIGNMENT Present Draft of Final, Tweak mistakes polish composite or final images

Week 16

Present Finals

Grading Information:**Weekly Assignments**

All assignments are to be delivered in a folder with your name, class #, and week # titled, if the assignment is Maya based ; with Maya project folders, and will be evaluated through Canvas within the week.

Each weekly assignment is worth 50 points each.

Section Assignments

All Section Assignments are to be delivered in a folder with your name, class #, and week # titled, if the assignment is Maya based ; with Maya project folders, and will be evaluated through Canvas within the week. Include a Playblasted video in the MOVIES folder of your Maya project Folder

Final Project Milestone is a final assessment of your ability to understand and implement the practices learned each week and is worth 300 points.

- 100 points towards overall visual quality and appeal of shot
- 100 points toward technical prowess of dynamics performed and executed
- 100 points toward integration of solid pipeline practices once pitched

● Professionalism (600 pts)

Professionalism is the highest quality a student of industry can gain and respect. Discussion, critique, and betterment of your peers will mirror 'dailies' in the industry through Canvas based discussion forums. We are all adults, the following are areas in which we will earn or lower your grade over the 16 weeks of class.

- Attitude (be excited)
- Tardiness
- Contributing and requesting of Critiques in class
- Deliverables (turning in what is asked for, the way its asked for)
- Effort
- Looking and smelling the part
- Presentation Quality
- Teamwork (Are you contributing effectively? Socially?)
- Timeliness (time spent on projects versus peers)

- Time tracking (What are you worth? How long are you taking?)

Example

| | Due Date | Assignment | Points |
|-----------------------|-----------------|---|---------------|
| Assignment #1 | | Place 3 Film and VFX Breakdowns on Oncourse Forums for review and discussion | 50 |
| Section Assignment #1 | | NParticles: Create a Render able wind, twister, or violent rain. 10 seconds due Week #4 | 100 |
| Section Assignment #2 | | Create Physics based simulation, One Rigid body, one soft body simulation. 5 seconds each. Due Week #6 A Playblast is sufficient. | 100 |
| Section Assignment #3 | | Using Hair Dynamics create a working Head of Hair, and simulate. 5 seconds of simulation only. This could be on a sphere, or better, a character. Due week #8 A render is required. | 100 |
| Section Assignment #4 | | Using NCloth Simulation and dynamics create a real working example. 5 seconds of simulation only. This could be a flag, pile of clothes, clothes on a character etc. Render is required. Due Week #10 | 100 |
| Final Proposals | | Propose Final Project, Full CG Shot from a cinematic, or composite using a film back plate. | 100 |
| Section Assignment #5 | | Fluids Section Assignment, Render Required Due week #12 | 100 |
| Section Assignment #6 | | 3D Tracking Assignment, Track a 2 or 3 axis camera move, render one of your past | 100 |

| | | | |
|-----------------------------|--|--|-----|
| | | simulations with tracked camera, and the Film. Due week#13 | |
| FINAL | | Full shot implementation of a 5-10 second dynamics shot. | 300 |
| Semester of Critique | | Overall attendance, effort, communication | 600 |

Grading Scale:

| | | |
|----|-----------|--|
| A+ | 97–100% | Professional level work, showing highest level of achievement |
| A | 93–96.99% | Extraordinarily high achievement, quality of work; shows command of the subject matter |
| A– | 90–92.99% | Excellent and thorough knowledge of the subject matter |
| B+ | 87–89.99% | Above average understanding of material and quality of work |
| B | 83–86.99% | Mastery and fulfillment of all course requirements; good, acceptable work |
| B– | 80–82.99% | Satisfactory quality of work |
| C+ | 77–79.99% | Modestly acceptable performance and quality of work |
| C | 73–76.99% | Minimally acceptable performance and quality of work |
| C– | 70–72.99% | Unacceptable work (Core course must be repeated for credit) |
| D+ | 67–69.99% | Unacceptable work (Course must be repeated for credit) |
| D | 63–66.99% | Unacceptable work |
| D– | 60–62.99% | Unacceptable work |
| F | Below 60 | Unacceptable work |

No credits are granted for a grade below C.

Grading Standards

A – Outstanding, high quality work.

- A fully completed project that demonstrates mastery of skills.
- Projects that display creative and sometimes innovative work.
- The students created many sketches and investigated several options before choosing one.
- Combinations of color schemes, space, and image layout were used effectively and chosen carefully for final project.

B – Good to very good work.

- The student completed the components of the project, but neglected to experiment with additional or more challenging technical approaches.

- The work demonstrates good abilities in the respective new media applications, but may lack depth and level of skill.
- Space was filled adequately and a few combinations of design were tried.
- The project could be lacking in areas of design, planning, or technical approach.

C – Average work.

- The work demonstrates average skills in depth, design, and application.
- No more than what was required of the course was completed.
- The work is possibly incomplete in parts or used the wrong file extension on handed in projects.

D – Below average work.

- The work is largely incomplete and displays a lack of effort.
- Very little time was put into the software and thusly resulted in poor quality work.
- The files handed in had errors or were unable to be downloaded.

F – Failure to complete the objectives of the course.

I - Incomplete

Students are expected to complete their work in the allotted time of this session. However, because of unforeseen hardships students may not be able to complete the project in the time established for completion of his/her work. To receive a grade of Incomplete you must have 75% of the course work completed at a passing level.

CODE OF CONDUCT

All students should aspire to the highest standards of academic integrity. Using another student's work on an assignment, cheating on a test, not quoting or citing references correctly, or any other form of dishonesty or plagiarism shall result in a grade of zero on the item and possibly an F in the course. Incidences of academic misconduct shall be referred to the Department Chair and repeated violations shall result in dismissal from the program.

All students are responsible for reading, understanding, and applying the *Code of Student Rights, Responsibilities and Conduct* and in particular the section on academic misconduct. Refer to *The Code > Responsibilities > Academic Misconduct* at <http://www.indiana.edu/~code/>. All students must also successfully complete the Indiana University Department of Education "How to Recognize Plagiarism" Tutorial and Test. <https://www.indiana.edu/~istd> You must document the difference between your writing and that of others. Use quotation marks in addition to a citation, page number, and reference whenever writing someone else's words (e.g., following the *Publication Manual of the American Psychological Association*). To detect plagiarism instructors apply a range of methods, including Turnitin.com. <http://www.ulib.iupui.edu/libinfo/turnitin>

Academic Misconduct:

1. **Cheating:** Cheating is considered to be an attempt to use or provide unauthorized assistance, materials, information, or study aids in any form and in any academic exercise or

environment.

- a. A student must not use external assistance on any “in-class” or “take-home” examination, unless the instructor specifically has authorized external assistance. This prohibition includes, but is not limited to, the use of tutors, books, notes, calculators, computers, and wireless communication devices.
 - b. A student must not use another person as a substitute in the taking of an examination or quiz, nor allow other persons to conduct research or to prepare work, without advanced authorization from the instructor to whom the work is being submitted.
 - c. A student must not use materials from a commercial term paper company, files of papers prepared by other persons, or submit documents found on the Internet.
 - d. A student must not collaborate with other persons on a particular project and submit a copy of a written report that is represented explicitly or implicitly as the student’s individual work.
 - e. A student must not use any unauthorized assistance in a laboratory, at a computer terminal, or on fieldwork.
 - f. A student must not steal examinations or other course materials, including but not limited to, physical copies and photographic or electronic images.
 - g. A student must not submit substantial portions of the same academic work for credit or honors more than once without permission of the instructor or program to whom the work is being submitted.
 - h. A student must not, without authorization, alter a grade or score in any way, nor alter answers on a returned exam or assignment for credit.
2. **Fabrication:** A student must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citation to the sources of information.
 3. **Plagiarism:** Plagiarism is defined as presenting someone else’s work, including the work of other students, as one’s own. Any ideas or materials taken from another source for either written or oral use must be fully acknowledged, unless the information is common knowledge. What is considered “common knowledge” may differ from course to course.
 - a. A student must not adopt or reproduce ideas, opinions, theories, formulas, graphics, or pictures of another person without acknowledgment.
 - b. A student must give credit to the originality of others and acknowledge indebtedness whenever:
 1. directly quoting another person’s actual words, whether oral or written;
 2. using another person’s ideas, opinions, or theories;
 3. paraphrasing the words, ideas, opinions, or theories of others, whether oral or written;
 4. borrowing facts, statistics, or illustrative material; or
 5. offering materials assembled or collected by others in the form of projects or collections without acknowledgment
 4. **Interference:** A student must not steal, change, destroy, or impede another student’s work, nor should the student unjustly attempt, through a bribe, a promise of favors or threats, to affect any student’s grade or the evaluation of academic performance. Impeding another

student's work includes, but is not limited to, the theft, defacement, or mutilation of resources so as to deprive others of the information they contain.

5. **Violation of Course Rules:** A student must not violate course rules established by a department, the course syllabus, verbal or written instructions, or the course materials that are rationally related to the content of the course or to the enhancement of the learning process in the course.
6. **Facilitating Academic Dishonesty:** A student must not intentionally or knowingly help or attempt to help another student to commit an act of academic misconduct, nor allow another student to use his or her work or resources to commit an act of misconduct.

OTHER POLICIES

1. **Administrative withdrawal:** Students must participate in all class discussions and conscientiously complete all required course activities and/or assignments. If a student is unable to attend, participate in, or complete an assignment on time, the student must inform the instructor. If a student misses more than half of the required activities within the first 25% of the course without contacting the instructor, the student may be administratively withdrawn from this course. Administrative withdrawal may have academic, financial, and financial aid implications. Administrative withdrawal occurs after the full refund period, and a student who has been administratively withdrawn is ineligible for a tuition refund.
2. **Civility:** To maintain an effective and inclusive learning environment, it is important to be an attentive and respectful participant in lectures, discussions, group work, and other classroom exercises. Thus, unnecessary disruptions should be avoided, such as ringing cell phones, engagement in private conversations, and other unrelated activities. Cell phones, media players, or any noisy devices should be turned off during a class. Texting, web surfing, and posting to social media are generally not permitted. Laptop use may be permitted if it is used for taking notes or conducting class activities. Students should check with the instructor about permissible devices in class. IUPUI nurtures and promotes "a campus climate that seeks, values, and cultivates diversity in all of its forms and that provides conditions necessary for all campus community members to feel welcomed, supported, included, and valued" (IUPUI Strategic Initiative 9). IUPUI prohibits "discrimination against anyone for reasons of race, color, religion, national origin, sex, sexual orientation, marital status, age, disability, or veteran status" (Office of Equal Opportunity). Profanity or derogatory comments about the instructor, fellow students, invited speakers or other classroom visitors, or any members of the campus community shall not be tolerated. A violation of this rule shall result in a warning and, if the offense continues, possible disciplinary action.
3. **Communication:** For classroom-based courses, the instructor or teaching assistant should respond to emails by the end of the next class or, for online courses, within two Indiana University working days, which excludes weekends and holidays. The instructor should provide weekly office hours or accept appointments for face-to-face, telephone, or teleconferenced meetings, and announce periods of extended absence in advance.
4. **Counseling and Psychological Services (CAPS):** Students seeking counseling or other psychological services should contact the CAPS office at 274-2548 or capsindy@iupui.edu. For more information visit <http://life.iupui.edu/caps/>.
5. **Course evaluations:** Course evaluations provide vital information for improving the quality

of courses and programs. Students are urged to complete one course and instructor evaluation for each section in which they are enrolled at the School of Informatics and Computing with the following exceptions: (a) The student has withdrawn from the course; (b) fewer than five students are enrolled in the section (in which case maintaining anonymity is difficult); and (c) the section is a laboratory that must be taken with a course having a different section number. Course evaluations are completed at <https://soic.iupui.edu/app/course-eval/>. Course evaluations are typically open from the eleventh week. Course evaluations are anonymous, which means that no one can view the name of the student completing the evaluation. In addition, no one can view the evaluation itself until after the instructor has submitted the final grades. In small sections, demographic information should be left blank, if it could be used to identify the student.

6. **Disabilities policy:** All qualified students enrolled in this course are entitled to reasonable accommodations for a disability. Notify the instructor during the first week of class of accommodations needed. Students requiring accommodations register with Adaptive Educational Services (AES) and complete the appropriate AES-issued before receiving accommodations. The AES office is located at UC 100, Taylor Hall (Email: aes@iupui.edu, Tel. 317 274-3241). For more information visit <http://aes.iupui.edu>.
7. **Email:** Indiana University uses your IU email account as an official means of communication, and students should check it daily. Although you may have your IU email forwarded to an outside email account, please email faculty and staff from your IU email account.
8. **Emergency preparedness:** Know what to do in an emergency so that you can protect yourself and others. For more information, visit the emergency management website at <http://protect.iu.edu/emergency>.
9. **IUPUI course policies:** A number of campus policies governing IUPUI courses may be found at the following link: http://registrar.iupui.edu/course_policies.html
10. **No class attendance without enrollment.** Only those who are officially enrolled in this course may attend class unless enrolled as an auditor or making up an Incomplete by prior arrangement with the instructor. This policy does not apply to those assisting a student with a documented disability, serving in an instructional role, or administrative personnel. <http://registrar.iupui.edu/official-enrollment-class-attendance.html> Children may *not* attend class with their parents, guardians, or childcare providers.
11. **Religious holidays:** Students seeking accommodation for religious observances must submit a request form to the course instructor by the end of the second week of the semester. For information visit <http://registrar.iupui.edu/religious.html>.
12. **Right to revise:** The instructor reserves the right to make changes to this syllabus as necessary and, in such an event, will notify students of the changes immediately.
13. **Sexual misconduct:** IU does not tolerate sexual harassment or violence. For more information and resources, visit <http://stopsexualviolence.iu.edu/>.
14. **Student advocate:** The Student Advocate assists students with personal, financial, and academic issues. The Student Advocate is in the Campus Center, Suite 350, and may also be contacted at 317 274-4431 or studvoc@iupui.edu. For more information visit <http://studentaffairs.iupui.edu/advocate>.

MISSION STATEMENT

The Mission of IUPUI is to provide for its constituent's excellence in

- Teaching and Learning;
- Research, Scholarship, and Creative Activity; and
- Civic Engagement.

With each of these core activities characterized by

- Collaboration within and across disciplines and with the community;
- A commitment to ensuring diversity; and
- Pursuit of best practices.

IUPUI's mission is derived from and aligned with the principal components—Communities of Learning, Responsibilities of Excellence, Accountability and Best Practices—of Indiana University's Strategic Directions Charter.

STATEMENT OF VALUES

IUPUI values the commitment of students to learning; of faculty to the highest standards of teaching, scholarship, and service; and of staff to the highest standards of service. IUPUI recognizes students as partners in learning. IUPUI values the opportunities afforded by its location in Indiana's capital city and is committed to serving the needs of its community. Thus, IUPUI students, faculty, and staff are involved in the community, both to provide educational programs and patient care and to apply learning to community needs through service. As a leader in fostering collaborative relationships, IUPUI values collegiality, cooperation, creativity, innovation, and entrepreneurship as well as honesty, integrity, and support for open inquiry and dissemination of findings. IUPUI is committed to the personal and professional development of its students, faculty, and staff and to continuous improvement of its programs and services.