COURSE DESCRIPTION

Intermediate organic modeling course, aimed at achieving high-detail, professional quality 3D models for games, film, architecture, science, and other application areas. This course will explore using the foundations 3D modeling, Sculpture, and Texture painting to output believable creations.

Extended DESCRIPTION

Students will develop a set of organic objects, and display them appropriately for their intended industry. Of possible objects, students will choose from stylized humans, creatures, and plants, the creations will be a believable, entertaining and/or instructional. Students will concept their proposals using traditional conceptual art techniques and reference gathered from real world.
Recommended Text:

**Anatomy for the Artist**
- **Publisher:** DK Publishing; First Edition, 3rd Printing edition (October 1, 2001)
- **ISBN-10:** 078948045X
- **ISBN-13:** 978-0789480453

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

**Principles of Undergraduate Learning (PUL):**

Learning outcomes are assessed in the following areas:

1A. Core communication: written, oral and visual skills
   - [OS – Minor emphasis]
1B. Core communication: quantitative skills
   - [QS - Some emphasis]
1C. Core communication: information resources skills
   - [IRS – Some emphasis]
2. Critical thinking
   - [CT – MAJOR emphasis]
3. Integration and application of knowledge
   - [AoK – MAJOR emphasis]
4. Intellectual depth, breadth, and adaptiveness
   - [ID - MAJOR emphasis]
5. Understanding society and culture
   - [SC - Some emphasis]
6. Values and ethics
   - [VE - Some emphasis]

**Learning Outcomes:**

<table>
<thead>
<tr>
<th>Upon completion of this course, the student will</th>
<th>PUL</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop, discuss, and implement from preproduction, to production, to post production of dynamics simulations for film or CG cinematic</td>
<td>CT, Aok, IRS, ID</td>
<td>Wk assign see pg 8-9</td>
</tr>
<tr>
<td>Create at minimum an advanced composite including several dynamics simulations for film or CG cinematic.</td>
<td>CT, AoK, ID</td>
<td>final</td>
</tr>
<tr>
<td>Interpret use, need, and efficiencies for visual effects pipelines</td>
<td>IRS, CT, Aok, ID</td>
<td>Wk assign see pg 8-9</td>
</tr>
<tr>
<td>Explore, create, experiment, and iterate visual effects</td>
<td>CT, Aok, ID</td>
<td>Wk assign see pg 8-9</td>
</tr>
<tr>
<td>Apply matchmoving, simulation, caching, and rendering pipelines to Production formats</td>
<td>CT, Aok, ID</td>
<td>Wk assign see pg 8-9</td>
</tr>
<tr>
<td>Deliver dynamics for film and short story projects as well as scientific simulation productions.</td>
<td>CT, Aok, ID</td>
<td>final</td>
</tr>
</tbody>
</table>
Software used:
Autodesk Maya 2014 +
Zbrush 4r6 +
Adobe Production Suite (Photoshop, AfterEffects, Premiere,)
Foundry MARI
Potential Plugins/software - Marmoset, Keyshot, Renderman, continuously updating, unique to student interest

EXPECTATIONS, GUIDELINES, AND POLICIES

Attendance:
For success in this class I expect students to attend each class session. I will only allow missed classes if you give me notice a full week in advance. This class has a stringent attendance policy of 1 dropped letter grade for each 2 classes missed. I will take attendance at the beginning of each class.

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 OnCourse. 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.

Exams/quizzes:
There are no exams or quizzes

Lab assignments:
Class tutorials and demos must be completed with the instructor. Failure to do so can result in a detrimental effect on effort and class participation scores.

Class assignments:
I WILL require homework exercises following tutorials or in class demo each week. I expect these to be completed by the next class.
Grading Information:

- Requirements (projects, papers, class participation)
- Percentage of each assignment
- If class participation is part of the final grade, you must explain to the student how the participation will be evaluated
- Method of assigning grades

WEEKLY SCHEDULE

Date for each class meeting:

- Specific pre-class readings
- Specific subject matter/topics covered
- Goals and objectives of each class period

Tentative Weekly Outline

Tentative Weekly Outline

Week 1:

Introduction
- View prior class projects
- Siggraph 2013/CGTalk/3D websites

Final Project Details
- Create your own character and creature
- Use Joints, Ik/FK kinematics, influence objects for pose

Lecture: Review Maya interface, controls and hotkeys for polygon modeling
Lab: Project Setup, discussion and inquiry.

Assignment:
(1) Create your own characters and creature concept art to use for the semester.
(2) Research Assignment: Locate 3 top 3D modelers online, document their work, process, and how they got into the trade.

Week 2:

Lecture: Modeling via Reference, topology planning
- Overview of fundamentals in modeling Polygons
- Edge Looping and Topology Instruction

Lab: Discuss kinesiology, and how edge-loops assist in animation for different industries

Assignment: Make 500k polygon mesh

Week 3:

4
Lecture: - Edge Looping and Topology Instruction / Anatomy & proportion Checks
- Modeling Edge Loops for facial structures, hand and feet
Lab: - Review Anatomy of student projects
Assignment: make 1k mesh

Week 4:
Lecture: Additional Modeling practice
Lab: 3, 30 minute modeling sessions
Assignment: 4k model

Week 5:
Lecture: Using Animation Deformers, for modeling checking anatomy, using reference
Lab: Open lab to begin modeling midterm
Assignment:

Week 6:
Lecture: - Unwrapping techniques in UV Layout and Maya for
- Unwrapping Techniques versus Maya
- Maya and Zbrush Workflow Theories
Lab: - UVLayout Demo
Assignment:

Week 7:
Lecture: Procedural Shaders vs File based Texturing for organic objects
Lab Introduce the HyperShader, creating relationships and
Assignment:

Week 8:
Texturing in Photoshop for organic objects, creation of diffuse, specular, and Bump maps,
Lab: Use photos, paint brushes, and layer adjustments

Week 9:
Lecture: Texturing in Zbrush using Polypaint and/or Spotlight for organic objects
Lab: Demo on Creature/Character
Assignment: Texture character and creature

Assignment: Milestone #2 Due Week #10
Week 10:
Lecture: Rigging Techniques
Applying Bones, CTRL shapes to pose your character for Maya
Lab: Demo Joints, IK, FK, and SPLINE IK Uses
Assignment: Create joint system, IK, and Spine IK for models

Week 11:
Lecture: Rigging Techniques
Blend Shapes and for posing the face in Maya
Lab: Demo Blend Shapes versus Influence Objects and Paint Weights
Assignment: Create blend shapes for models

Week 12:
Lecture: Rigging Techniques
Skinning Geometry, Wrapping Geometry for additional Assets
Lab: Show Weight Painting

Assignment: Milestone #3 due Week #13

Week 13:
Lecture: Rendering Techniques using SSS and Ambient Occlusion and 3 Point lighting
3 point Lighting
Lab:
Assignment:

Week 14:
Lecture: Rendering Techniques
Creating Turntable for Character Reels, rendering sequences
Lab: Work on setting up Render layers and Passes in After Effects
Assignment:

Week 15:
Lab: WorkDay
Assignment:

Week 16:
Present Final Project and Turntables/Unity/Unreal Integration
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 Oncourse within the week.

  Each weekly assignment is worth 50 points each.

  Weekly assignments will consist of certain body parts and beginning to develop an appreciation of how the body works and moves. Students will learn to see, be patient, and develop a strong sense of foundations in proportion and anatomy.

- **Milestone # 1** is a preliminary check on character modeling and anatomical foundation and understanding Worth 100 pts

- **Milestone # 2** is a secondary check on character believability and texturing understanding on Organic character modeling. Worth 100 pts

- **Milestone # 3** is a tertiary check on character articulation and rigging capabilities based anatomical foundation, Worth 100 pts

- **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 model and quality
  - 100 unwrap texture quality on Diffuse, Specular, and bump channels
  - 100 points the Pose, render and display of final product

- **Professionalism (100 pts)**

  Professionalism is the highest quality a student of industry can gain and respect. We are all adults, the following are areas in which we will earn or lower your grade over the 11 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:**

<table>
<thead>
<tr>
<th>Due Date</th>
<th>Assignment</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assignment #1</strong></td>
<td>Conceptual Art, Research 3 Character Artists</td>
<td>50</td>
</tr>
<tr>
<td><strong>Assignment #2</strong></td>
<td>500 base mesh #1 (plant)</td>
<td>50</td>
</tr>
<tr>
<td><strong>Assignment #3</strong></td>
<td>1k polygon mesh (animal)</td>
<td>50</td>
</tr>
<tr>
<td><strong>Assignment #4</strong></td>
<td>4k polygon mesh (character)</td>
<td>100</td>
</tr>
<tr>
<td><strong>Assignment #5</strong></td>
<td>Model accessories for plant animal and character, prep for unwrap</td>
<td>50</td>
</tr>
<tr>
<td><strong>Assignment #6</strong></td>
<td>Polish Models and accessories, prep for unwrap</td>
<td>50</td>
</tr>
<tr>
<td><strong>Milestone #1</strong></td>
<td>All models unwrapped</td>
<td>50</td>
</tr>
<tr>
<td><strong>Assignment #8</strong></td>
<td>Begin texturing character and creature, and all other accessories</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Export textures, prep for Maya</td>
<td>100</td>
</tr>
</tbody>
</table>

**Grading Scale:**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>100%</td>
<td>Professional level work, showing highest level of achievement</td>
</tr>
<tr>
<td>A</td>
<td>93–99%</td>
<td>Extraordinarily high achievement, quality of work; shows command of the subject matter</td>
</tr>
<tr>
<td>A−</td>
<td>90–92%</td>
<td>Excellent and thorough knowledge of the subject matter</td>
</tr>
<tr>
<td>B+</td>
<td>87–89%</td>
<td>Above average understanding of material and quality of work</td>
</tr>
<tr>
<td>B</td>
<td>83–86%</td>
<td>Mastery and fulfillment of all course requirements; good, acceptable work</td>
</tr>
<tr>
<td>Grade</td>
<td>Percentage</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>B−</td>
<td>80–82%</td>
<td>Satisfactory quality of work</td>
</tr>
<tr>
<td>C+</td>
<td>77–79%</td>
<td>Modestly acceptable performance and quality of work</td>
</tr>
<tr>
<td>C</td>
<td>73–76%</td>
<td>Minimally acceptable performance and quality of work</td>
</tr>
<tr>
<td>C−</td>
<td>70–72%</td>
<td>Unacceptable work (Core course must be repeated for credit)</td>
</tr>
<tr>
<td>D+</td>
<td>67–69%</td>
<td>Unacceptable work (Course must be repeated for credit)</td>
</tr>
<tr>
<td>D</td>
<td>63–66%</td>
<td>Unacceptable work</td>
</tr>
<tr>
<td>D−</td>
<td>60–62%</td>
<td>Unacceptable work</td>
</tr>
<tr>
<td>F</td>
<td>Below 60</td>
<td>Unacceptable work</td>
</tr>
</tbody>
</table>

No credits toward major, minor, or certificate requirements are granted for a grade below C. No credits toward general education or elective requirements are granted for a grade below C−.

**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/](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](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](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. **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.

2. **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](http://registrar.iupui.edu/course_policies.html)

3. **Classroom 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
class. Texting, surfing the Internet, and posting to Facebook or Twitter during class
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.

4. **Bringing children to class:** To ensure an effective learning environment, children are
not permitted to attend class with their parents, guardians, or childcare providers.

5. **Course Evaluation Policy:** Course evaluations provide vital information for
improving the quality of courses and programs. Students are required to complete one
course and instructor evaluation for each section in which they are enrolled at the
School of Informatics and Computing. This requirement has three exceptions: (a) The
student has withdrawn from the course; (b) only one student is enrolled in the section
(in which case anonymity is impossible); 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/](https://soic.iupui.edu/app/course-eval/). Course evaluations are 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 for the
course. In small sections, demographic information should be left blank, if it could be
used to identify the student. A course evaluation must close before the grade for that
course can be released. To ensure students have had ample opportunity to complete the
evaluation, an uncompleted course evaluation could delay the release of the grade for
up to a week.

6. **Communication:** The instructor should respond to emails within 48 hours, excluding
weekends and holidays, and announce periods of extended absence in advance. The
instructor should provide weekly office hours or accept appointments for face-to-face,
telephone, or teleconferenced meetings.

7. **Email:** Indiana University uses your IU email account as an official means of
communication, and students should check it daily for pertinent information. Although
you may have your IU email forwarded to an outside email account, please email
faculty and staff from your IU email account.

8. **Disabilities Policy:** In compliance with the Americans with Disabilities Act (ADA), all
qualified students enrolled in this course are entitled to reasonable accommodations.
Please notify the instructor during the first week of class of accommodations needed
for the course. Students requiring accommodations because of a disability must 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). Visit [http://aes.iupui.edu](http://aes.iupui.edu)
for more information.

9. **Administrative Withdrawal:** A basic requirement of this course is that students
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, it is the student’s responsibility to 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 will
take place after the full refund period, and a student who has been administratively
withdrawn from a course is ineligible for a tuition refund. Contact the instructor with
questions concerning administrative withdrawal.

10. **Emergency Preparedness:** Safety on campus is everyone’s responsibility. Know what
to do in an emergency so that you can protect yourself and others. For specific
information, visit the emergency management website. [http://protect.iu.edu/emergency](http://protect.iu.edu/emergency)

**MISSION STATEMENT**

The Mission of IUPUI is to provide for its constituents 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.