Purdue NExT ™

Your Expertise: Evolved

Steve Dunlop - Managing Director

Basic Questions

- What is **Immersive Learning** ?

- Can powerful computing capability connected to the internet enable **immersive learning** ?

- Will individual student tracking of performance improve **immersive learning** ?

- How to improve the user interface for online learning

Background

- Purdue NExT had its origins in HUBzero™ (funded by NSF)

- Funding from the Provost's office, to create non-credit courses with faculty across Purdue

- Organized as an independent initiative with finances run through PEC

- Dual use of Hubzero technology –

  - tools and tool development
  - learning management system

Purdue NExT

- Non-credit badges
- Unique Academic Business Model
  - Revenues net of costs returned to faculty research centers and academic units
- Engaging other Purdue developed software – Passport, etc
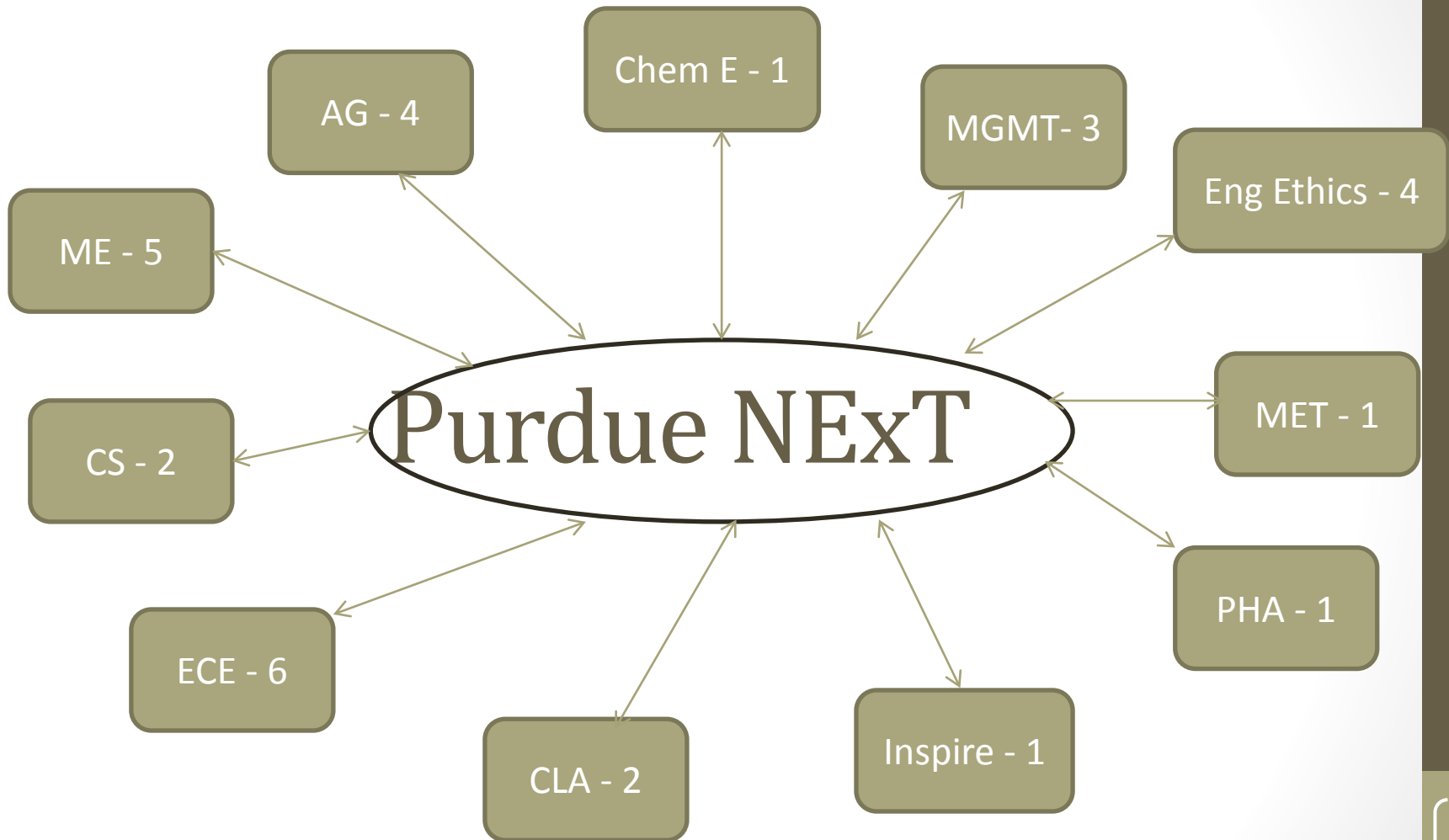
Focus on Immersion

Faculty have focused on engaging students using

- Real world motivating examples
- Computer Simulations
- Interaction
- Real Data sets
- Visualizations
- Animation
- New tools to enhance learning

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Current Course/Faculty Status and projections

- 30 faculty, across schools, are engaged actively in course development or specific course discussions
- 46 courses are targeted for release between August 2013 and May 2014
- Target markets vary from US, international, educational and corporate customers. Likely match for each course set to market may be different.
- Purdue West Lafayette Campus – Free, extension of current course offering

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Purdue NExT- engaged with
30 faculty across academic units

Chem E - 1

AG - 4

MGMT- 3

Eng Ethics - 4

ME - 5

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MET - 1

CS - 2

PHA - 1

ECE - 6

CLA - 2

Inspire - 1

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Example course modules available for review

1. VLSI and Circuit Design – faculty introduction, close captioned, slides, transcript, interaction, SPICE, Cadence example (leakage in stacked transistors), PETE, Quiz, Exam
2. Lean Supply Chain Proficiency – faculty lecture, Exercise introduction, Pig Exercise
3. Optimization Modeling of Economic Systems – GAMS optimization and quiz
4. Dynamics – Kinematics – Working model simulation
5. Fundamentals of Nanoelectronics - Octave
6. Thermal Energy at Nanoscale – Mathematic CDF
7. Complex System Presentation tools
8. Hybrid Electric Vehicles
9. Global Sustainability

Purdue NExT Architecture

- **Topic Certificate** (requires a series of courses/badges to be completed)
- **Course** – certificate/badge – consists of **modules**
- **Modules** in a course will have **components**

1. <u>Lectures</u> (close captioned), slides, transcript
2. <u>Direct interaction</u> with lecture videos via captioning
3. <u>Activities</u> – Hands - on
4. <u>Homework</u> - monitored
5. <u>Exam</u> – time stamped
6. <u>Resources</u> (Link to research/teaching community), Discussion Boards

KEY: Interactive Simulations to understand concepts tested in the exams and exercises

Purdue NExT – Introduction

Purdue NExT Delivery System

Student Progress

Exams / Quizzes

Course overview

Course Outline

Student Dashboard

Discussion Community

Interactive Lecture Search
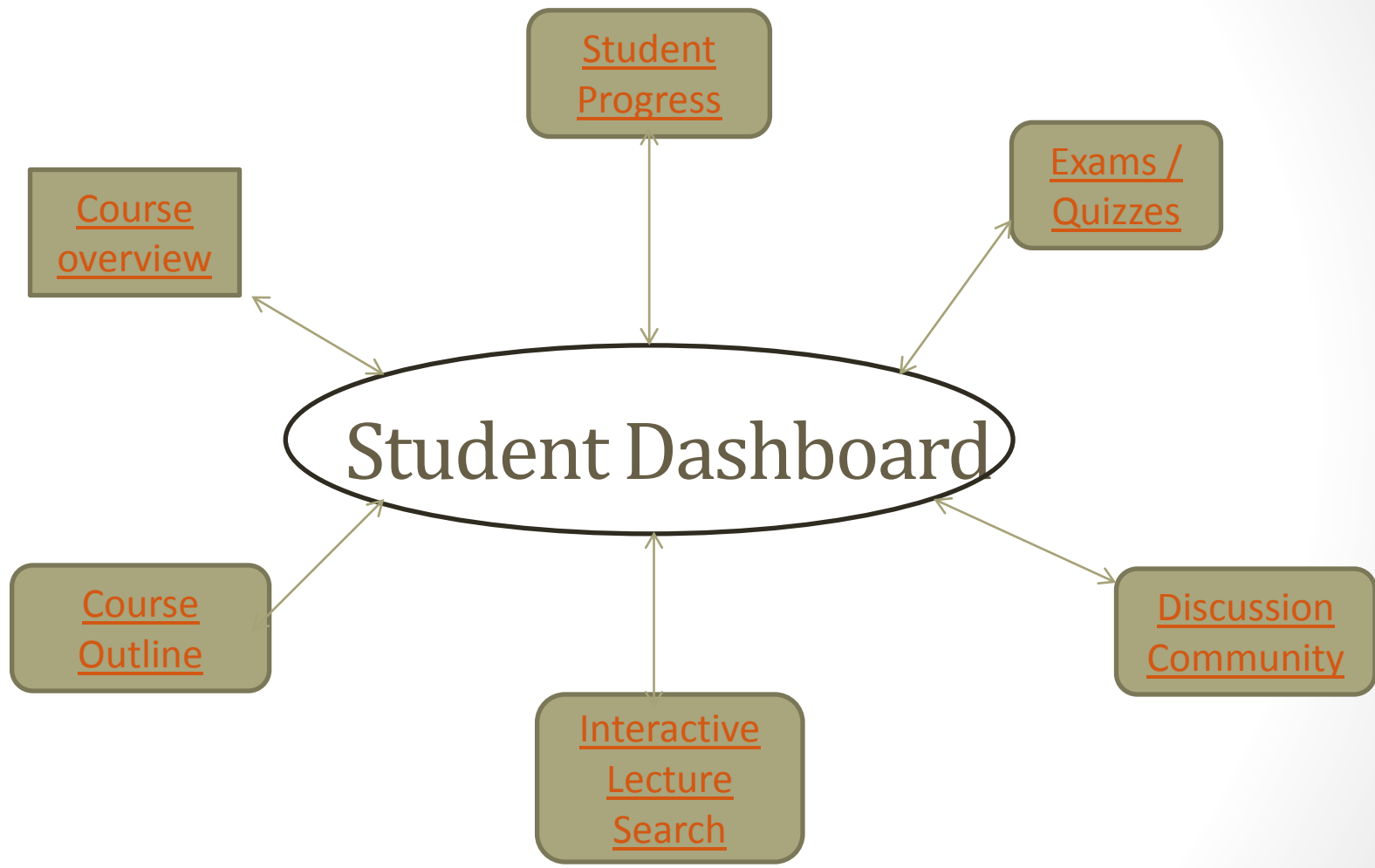
Purdue NExT – Module layout

EXAM 1

1. One assumption in the derivation of leakage currents in MOSFETS is…
   - ○A. there are multiple energy levels in the channel.
   - ○B. that coupling with contacts is ignored.
   - ○C. that the effect of V_{ds} on ε is not being ignored.
   - ○D. that the flatband voltage > 0.
   - ○E. that the Fermi function is approximated by a logarithmic function.

2. Which of the following are advantages of supply gating for logic?
   - I.   5 – 20x leakage reduction
   - II.   Scalable
   - III. Ease of Design
   - IV.   Floated Output

Purdue NExT – Student Grading Display

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Purdue NExT Working Model

Purdue NExT – Discussion Forum

Purdue NExT – Searchable Close Caption

- Faculty Training
  - Training on LMS
  - Domain specify discussions
- Sections
  - Cohort Programs
  - Faculty Training
  - Common Discussion format
- Sticky Notes

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Interactive Activities

- Unity
- Working Model
- PETE
- Lean Pig Activity
- GAMS
- CDF
- OCTAViEw
- Live Scribe
- Cadence / Spice
- VB Application for Operations Management

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Sales

- Deltak contracted to market Purdue NExT products – they are paid a % of the revenue that adjusts to course volume. Deltak purchased by John Wiley – they will now do global sales of Purdue NExT

- Faculty contacts leveraged
    - Available at no charge to Purdue University students
    - North America universities (example - ME courses)
    - North America institutions (government, nonprofits)
    - Corporations for employee skills development
    - K-12 Teacher Professional Development (Inspire)
    - K-12 Students (STEM)
    - India (both to companies and universities)
    - South America (Colombia)

Path forward

- Share all technology choices with Purdue faculty and serve as a resource for faculty

- Incorporate faculty learning outcomes assessment and input to improve course structure and quality

- Future looking ideas – leverage large datasets at Purdue and elsewhere, immersive interdisciplinary courses, flipped classroom etc.

- Use of best in class tools (Hubzero, Kaltura, 3Play, Gengo, Videography)

- Faculty lead Evaluation / Quality teams

- CEC credits for badges (5 credits per badge)

Possible Datasets

- Data sets – high frequency trading, trade data, retail data, GPS trails

- Audio files – soundscapes (frequency files)

- Video files –

- Twitter files

Please call us to discuss opportunities at Purdue NExT

Contact Details

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Questions

THANK YOU