

# **A Retrospective View of the *Premier Award for Excellence in Engineering Education - What Works and the Challenges Ahead***

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# Outline

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- Introduction to **NEEDS**
- History and Overview of the *Premier Award for Excellence in Engineering Education Courseware*
- Lessons Learned
- Next Steps



# NEEDS

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- National digital library emerging from Synthesis Coalition (1990)
- Integrated database of multimedia courseware (modules - case studies - full courses)
- Multilevel courseware evaluation system (peer review, *Premier Award for Excellence in Engineering Education Courseware*)
- Community of Engineering Educators

**NEEDS**  
*needs*

**P**  
*Premier Award*

# www.needs.org



A Digital Library for Engineering Education

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## Aircraft Dynamics



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**Title:** [Aircraft Dynamics](#)

**Authors:** [Robert F Stengel](#)

**Publisher:** [Princeton University \(01/1998\)](#)

**Courseware**

**Series:**

**Version:** 1999.02.20

**Summary:** [This web-based software teaches the user concepts about aircraft dynamics.](#)

# Premier Award Goals

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- Enhance Recognition of Scholarly and Creative Effort of Courseware Developers
- “Raise the Bar” for Excellence in Engineering Education Courseware

autodesk®



Microsoft  
Research

The  
MATH  
WORKS

needs

P  
Premier Award

# Premier Award Criteria

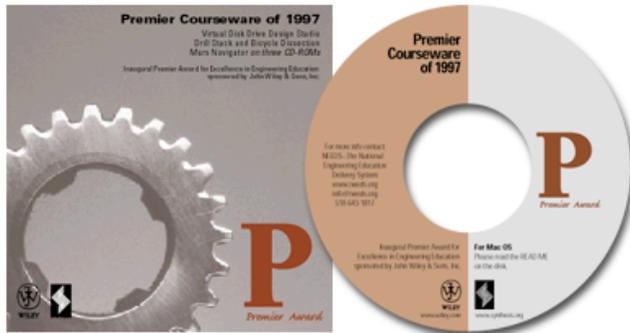
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- **Instructional Design**
  - **Will students learn from the courseware?**
- **Software Design**
  - **Is it well designed and usable?**
- **Engineering Content**
  - **Is the content well organized?**



# Premier Courseware of 1997 and 1998

- Virtual Disk Drive  
Design Studio
- Drill Dissection and  
Bicycle Dissection
- Mars Navigator
- Della Steam Plant
- MDSolids
- Structural Engineering  
Visual Encyclopedia -  
UNH



# Premier Courseware of 1999 and 2000

- Engineering Graphics
- Cracking Dams
- Project Links
- West Point Bridge Designer



For info or to receive copies go to <http://www.needs.org/premier/>



# Recognition for Courseware Developers

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- Over 9,000 *Premier Award* CD' s distributed
- 39 applicants since 1997
- 10 Awardees
- *Premier Award* courseware consistently in the top 20 most frequently downloaded courseware in NEEDS

Applications for 2001 DUE: July 13



# Recognition - continued

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## ➤ Study of *PA* awardees and non-awardees

- Interviews of awardees:

*“... it’s amazing, having won the award, how people in my department, all of a sudden, they’re thinking, ‘Maybe, just maybe, he’s doing something that’s of value.’ So the best benefit I’ve received is that I now can say someone else thinks this of value...So that is a tremendous value.”*

(Premier Awardee)

## Recognition - continued

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*“It meant a lot to me to get the award and... I kind of have been laboring on my own, and to actually get to go to the conference last year and get a little bit of recognition...you know, it was really nice... my trophy is sitting right on my desk; I look at it all the time. And I’m very pleased with it, and it was very encouraging to continue what I’m doing....”*

**(Premier Awardee)**

# Recognition - continued

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- **Survey of non-awardees**
  - 70% would apply again
  - 60% believe *PA* would have positive affect on career
  - 60% thought *PA* effective way to educate campus administration about the need to reward faculty developing courseware

*“We applied for the recognition that such an award brings. There is no direct reward from my university for taking the time to be innovative in course development”* (Premier Award Applicant)

# **“Raise the Bar” for Excellence in Engineering Educational Materials**

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- **In 1999 revised scoring method to**
  - **Improve reliability**
  - **Focus scoring on Instructional Design and student learning through 2 tier scoring process**
    - **courseware must meet minimum requirements to be considered in the top tier**
    - **Courseware must earn points from 2nd tier to be considered exceptional.**

# Scoring criteria: Interactivity

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- **The learner is actively involved in the learning process - the interaction enhances learning**
  - **Software responds to learner actions**
  - **Communication is 2-way**
  - **Learners control their own pace**
  - **Choices are meaningful**
- **Interactivity is enhanced if:**
  - **Learners solve relevant problems**
  - **System adapts based on learner actions**

# Demonstrating Excellence

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- **Award winning courseware addresses:**
  - **Higher level cognitive skills**
    - **Critical thinking**
    - **Problem solving**
    - **Design**
    - **Real life engineering situations, case studies**
    - **Simulations and experimentation**

# Demonstrating Excellence, continued

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- **Adaptable to multiple learning levels, institutional goals, learning situations (classrooms, self learning)**
- **Addresses different learning styles**
  - **Visualization, animation**
  - **Numerical, descriptive**
  - **Practice problems, interactive games**
- **Includes information to support adaptation**
  - **Student reviews**
  - **Instructor's guides**

## In sum....

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- ***Premier Award*** has a positive impact on awardee careers.
- ***Premier Award*** software is highly regarded by engineering faculty and popular.
- The quality of ***Premier Award*** applications appear to be rising.

# Next Steps

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In partnership with SMETE.ORG, NEEDS is:

- Expanding the use of the *Premier Award* criteria to other SMET disciplines, e.g.,
  - **JOMA - Journal of Online Mathematics and its Applications**
  
- Build on *Premier Award* criteria by partnering with MERLOT to establish and conduct a joint peer review program