

NEEDS

The National Engineering Education Delivery System

**Workshop on
Advanced Technology
for Engineering Education and Training
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Outline

Questions . . .

Brief History

What is NEEDS?

Reviews of Courseware

Into the Future . . .

Brief History

Synthesis Coalition Established 1990

Synthesis Coalition Goals

- Reform curricula
- Improve retention
- Link to K-14
- **Develop digital infrastructure**

NEEDS is the digital infrastructure developed by Synthesis

National Engineering Education Delivery System (NEEDS)

Three Components Connected Through the Internet

Delivery

Classrooms
Instructional Labs
Small Study Groups
Residences
Libraries
Anywhere

Development

Courseware Studios
Instructional Labs
Faculty Offices & Residences
Libraries
Anywhere



www.needs.org

NEEDS Database: www.needs.org

The screenshot shows the NEEDS website interface. On the left is a vertical navigation menu with the following items: NEEDS HOME PAGE (house icon), NEEDS INFORMATION (letter I icon), SEARCH DATABASE (letter S icon), REVIEWS OF COURSEWARE (letter R icon), CATALOG COURSEWARE (letter C icon), OTHER RESOURCES (letter O icon), NSF COALITIONS (letter N icon), and SYNTHESIS HOME PAGE (lightning bolt icon). The main content area features the NEEDS logo (National Engineering Education Delivery System) and a welcome message: "We're pleased to debut our 'new and improved' website -- we're redesigning and refining all aspects of this website to improve your ability to find material on NEEDS. This new look is just the first step in the continuing evolution in NEEDS. We're orienting our operations around serving our customer -- that's you! If you ever have any problems with NEEDS or can't seem to find what your looking for, send us email at help@needs.org." Below this is a paragraph starting with "NEEDS is the infrastructure developed by SYNTHESIS, one of the Engineering Science For...". A search form is located at the bottom right, with fields for Title, Author, subject Heading, and Keywords, and buttons for Query and Reset. A red box highlights the "NEEDS HOME PAGE", "NEEDS INFORMATION", and "SEARCH DATABASE" options in the navigation menu.

Available
1993-1994
via Telnet

Since
Sept. 1994
WWW

Search, Browse, Display
and Download Courseware

Expanding NEEDS Services to develop the Foundation for an On-line Community

User and Author Services

- User reviews of courseware
- On-line discussion
- Adoption/Adaptation Usage statistics for the author

NEEDS Services

- Extended Usage Tracking
- User Registration and Profiles

New Services Available from Catalog Records

 The picture can't be displayed.

Affiliations
Discussion
Peer Review
User Review
Feature Review
Awards
Support Materials

Evolving NEEDS with New Advances in Technology

Participate with Educom's Instructional Management System Project

- NEEDS (through the University of California) is a development partner of IMS**
- Emerging Metadata standards**
- The IMS Metadata fields and NEEDS cataloging fields are nearly a 1-to-1 match**

www.imsproject.org

NEEDS is More than Just a Database of Courseware

Evaluation and Review of Courseware

- Premier Award for Excellence in Engineering Education Courseware**
- Peer Review of Courseware**

Information on the NSF Engineering Education Coalitions

- (<http://www.needs.org/coalitions/>)**

Developing an On-line Community

- User reviews of courseware**
- On-line discussion**

Quality Review of Courseware on the NEEDS Database

**Establish Credibility of NEEDS as a Source of
Quality Educational Material**

**Enhance Recognition of Scholarly and Creative
Effort of Courseware Developers**

Levels of Review

- Non-reviewed
- Gestalt Peer Review: Endorsed Courseware
- National Competition: Premier Courseware
- **User Reviews: User experiences with courseware,
contributed by community members**
- **Feature Reviews: Extended reviews on NEEDS that
highlight courseware**



New!

Peer Review Criteria

Is content error-free?

Are the target audience and educational goals consistent with courseware content?

Can the courseware be used by an instructor other than the author?

Should the courseware be Endorsed?

Premier Award Criteria

See <http://www.needs.org/premier/1998/criteria.html> for more info

Engineering Content

- Is the content error free?

Software Design

- Is it well designed and usable?

Instructional Design

- Will students learn from the courseware?

We recognize that all the categories are interwoven.

Evaluation Criteria

Engineering Content:

- Accuracy of content
- Organization of content
- Consistency with learning objectives

Software Design:

- Engagement
- User interface and navigation
- Interactivity
- Multimedia use
- Technical reliability

Evaluation Criteria, cont.

Instructional Design:

- Interactivity
- Cognition/conceptual change
- Content
- Multimedia use
- Instructional use/adaptability

Premier Courseware of 1997

**Virtual Disk Drive
Design Studio
Drill Dissection and
Dissection
Mars Navigator**



**See
<http://www.needs.org/premier/1997/>
for more info**

Distribution

**1300 Copies to FIE '97 Participants
300 Copies to Engineering Deans
500 Copies available at ASEE '98**

**Visit us in Booth
123 at ASEE 98**

1998 Premier Award Competition

**Submit by July 10, 1998 to be eligible for
the 1998 Premier Award Competition**

To be presented at FIE 1998, Tempe, Az

**See <http://www.needs.org/premier/1998/> for
more info**

**Visit us in Booth
123 at ASEE 98**

Goals:

Continue NEEDS as a Service to the Engineering Education Community

- Transition from a research to a service organization
- Dissemination vehicle for Courseware developers
- Bridge the Gap to a NSF-sponsored Digital National Library

The Coalitions are taking the lead to bridge this gap and we invite all interested parties to participate.

A Digital National Library

Should NSF Establish and Fund a Digital National Library for Undergraduate Science, Mathematics, Engineering and Technology?

April 18, 1996 - NSF Committee Meeting (LIBUSE)

- “Towards a National Library for Undergraduate Science Education Resources in Science, Mathematics, Engineering and Technology”

August 7-8, 1997 National Research Council

- Digital National Library for SME&T Education Workshop

March 13, 1998 - NSF-DUE

- SMETE-Lib Steering Committee Meeting

Later 1998 - SMETE-Lib Workshop

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