

## Redesigning Engineering Graphics to Include CAD and Sketching Exercises

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## ASEE 2001 Conference

- How should Engineering Graphics be taught?
  - Engineering curriculum?
  - How many semesters?
  - Content?
  - Manual drafting?
  - Computer-aided design (CAD)?

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## St. Ambrose University – IE110

- A one-semester course
- Theory of engineering graphics
  - Lectures
- Hands-on CAD
  - Labs

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## Last Year's Observations

- CAD content was acceptable
- EG book is obsolete
  - Use of instruments for drawing
  - Geometric construction
  - Descriptive Geometry
  - Oblique projection
  - Lettering and lines
  - Multiview drawing construction
- Need to improve focus on drawing creation and interpretation

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## ASEE2001 Audience Concerns

- Visualization
- Sketching

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## When CAD is used, how should EG be taught?

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## Engineering Graphics Goals

- **Engineers should be able to communicate effectively**
  - Writing courses
  - Design courses (need for EG course)

## Need for EG and CAD

- **SME – Manufacturing Education Plan (1997)**
  - CAD/CAM
  - Geometric dimensioning and tolerancing
  - Blueprint reading
- **National Coalition for Advanced Mfg.**
  - CAD & Blueprint reading
- **Employers**
- **Student comments**

## IE110 Course Objectives

- **Understand how engineering designs visually are communicated.**
- **Learn to use advanced modeling computer-aided design software.**

## This Year's Changes to EG Course

- **Sketching**
- **Drawing interpretation**
- **CAD projects**

## Books

- **“Interpreting Engineering Drawings” by Jensen**
- **“Engineering Design with SolidWorks 2001” by the Planchards**

## Jensen Book

- **Simple to complex**
- **More material than one semester**
- **I use 21 of the 52 units**
  - Working drawings
  - Inclined and circular features
  - Drawings to scale
  - Surface texture
  - Tolerances and allowances
  - Inch and metric fits
  - Sectioning
  - Auxiliary views

## Jensen Examples

- Sketching
  - Simple
  - More complex
- Blueprint reading

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## Planchards Book

- Project-based
- Current version of Solidworks
- Create models, assemblies, and drawings

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## Example

- Guide-rod
- Drawing

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## Future Improvements

- Determine proper number of assignments
- Develop multimedia modules
- Geometric tolerancing

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## Conclusion

- Achieving course goals
- Textbooks work well together
- How should EG be taught?
- Students enjoy the class (except for the amount of work)

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## Discussion

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