



helping instructors teach with technology

digital media
center*2008 TECHNOLOGY-ENHANCED LEARNING (TEL) GRANT PROGRAM***APPLICATION FORM**

If you have questions about the program or require assistance in completing this form, please contact the Digital Media Center's TEL Grant Program manager, **Kurtis Scaletta**, kurtis@umn.edu, (612) 624-1323.

Project Title:	Biodeterioration Diagnostics Database
Abstract (50 words):	Replacement of bio-based materials (e.g., wood) deteriorated by pests costs billions annually and wastes resources. ⁵ Mastering biodeterioration diagnostics takes years, but bioproducts and associated problems are changing rapidly. There is a growing knowledge gap. A technology-enhanced approach offers a solution: an online database of community-contributed case studies for teaching diagnostics.

I. PRINCIPAL INVESTIGATOR/PRIMARY CONTACT

Please designate a single investigator to whom we can address official correspondence, and enter this investigator's name in the space provided.

Name:	Jonathan S. Schilling		
Department:	Bioproducts & Biosystems Engineering		
College or Unit:	CFANS		
Campus Address:	108 Kaufert Lab – 2004 Folwell Ave. – Saint Paul		
Telephone:	612-624-1761	E-mail:	schilling@umn.edu

II. ADDITIONAL INVESTIGATORS

Not Applicable

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III. PROJECT DESCRIPTION

1. LEARNING ACTIVITY OR PROCESS (104 WORDS)

Professional database and web designers will help Schilling create an online repository for biodeterioration case studies. Contributors will follow template fields that include geographic location, problem description, diagnoses of causal biological agents, and potential remediation/avoidance strategies. A navigation menu will allow users to browse by causal agent, and the site will be searchable by keyword. Full case studies will be printable and citable. With contributions from both professionals and students, the database will provide students with 1) a venue for classroom collaboration, 2) a web-based project with deliverables that can easily be graded, and 3) a compendium of real-world scenarios to use for practice.

2. COURSES AFFECTED (48 WORDS)

Organisms Impacting Bio-based Products (BBE 4/5302, Schilling) covers 'pests' affecting bioproducts and structures. Similar courses at Maine (WSC 319, Goodell), Mississippi State (42/6213, Amburgey), and Oregon State (WSE 611, Morrell) will also use the database. These colleagues are likely co-PI's for future grants aiming to expand the database.

3. LEARNING OUTCOMES (34 WORDS)

- A) Improved ability to identify, define, and solve current biodeterioration problems
- B) Improved critical evaluation skills in real-world scenarios
- C) Mastery of the contemporary knowledge base
- D) Understanding of the context of biodeterioration problems within and across societies

4. TEAM ROLES (64 WORDS)

Schilling and his class will transition from a prototype wiki with templates^{3,4} to the new database developed mid-Summer. Schilling will continue consulting with Michael Dunham at Specialized Computer Services (SCS) and hire his team for site development. In kind, Schilling will manage site contributions, present and solicit submissions at a meeting in Turkey (with travel help from this grant), and pursue outside funding.

IV. PERSONAL STATEMENT (150 WORDS)

I structured my biodeterioration class based on ten years of teaching experience. My pedagogical approach is not simply to convey information, but to excite students and demonstrate real-world consequences. My students typically have little biological training and are more interested in engineering. Case studies ('when things go wrong') are a convincing way to teach smart design, to provide diagnostics practice, and to instill in students the economic and environmental costs of failure.

There is no published diagnostics collection, and gaining hands-on experience is very difficult for students, and, frankly, for young professionals like myself. This inspired my interest in a tech-enhanced approach, an approach already used by clinical pathologists.^{1,2} An updated database can keep students and professionals on pace in a rapidly-evolving field, and if properly framed, could attract other users such as builders and inspectors. This TEL grant could therefore have high impact per dollar and attract more funding.

V. TIMETABLE & BUDGET

1. PROJECT TIMETABLE (BEGINNING APRIL 2008)

TASK ↓	Project Month →	A	M	J	J	A	S	O	N	D	J	F	M
Consult w/ Specialized Computing Services (SCS) - design phase plan*		←											
Remove files and discontinue wiki		x											
SCS database design (4 phases, see Project Budget for breakdown)		x	x	x	x								
Present w/ call for contributions at IRG-WP meeting in Turkey			x										
Manage database, troubleshoot				x	x	x	x	x	x	x			
Troubleshooting consult with SCS											x		
Incorporate into BBE 4/5302 Class											x	x	→
Pursue funding, expand site*												x	→
TEL Cohort Meetings (tentative)		x		x			x			x		x	
TEL Seminar							x						
TEL Poster, Student Learning Report													x

* (←)tasks leading up to the funding cycle, (→)tasks continuing after the funding cycle

2. PROJECT BUDGET

Expense	Rationale	TEL	Match (CUFS#)
SCS Database Services	Consult w/ Michael Dunham & team (2/13/08) – Quote given		Pre-grant
SCS Database Services	Phase I – Database creation and design (back end), 13 hours @\$72/hr (same rate for all Phases, per quote)	\$936	
SCS Database Services	Phase II – Web creation (front end), 62 hours	\$4464	
SCS Database Services	Phase III – Image upload setup, 30 hours	\$2160	
SCS Database Services	Phase IV – Email notification setup, 4 hours	\$288	
Website URL	Web hosting w/ JaWS @ \$136/setup charge, \$10/monthly Linux charge, and \$15/monthly mySQL fee	\$436	
Meeting Registration	Presentation and call for contributions at the most visible meeting for biodeterioration diagnosticians: IRG-WP in Istanbul, Turkey, May 25-29, 2008 http://www.irg39.com/	\$752	
IRG-WP Travel	Flight to Istanbul (Orbitz.com, 2/14/08)	\$938	
Meeting Expenses	Food and Lodging in Istanbul (CONUS \$301/day – 8 days meeting + travel time)		\$2408 (377-3000)
Faculty Salary	Schilling's salary (one month at \$6932, 31.6% fringe), to implement, manage, and integrate database into his class at the University (BBE 4/5302 Organisms Impacting Bio-based Products), part of his 50% teaching appointment		\$9122 (408-1000)
Research Fellow	Yasmin Sagiv, Schilling lab member, for database maintenance, 30 hours @\$14.50/hr, 7% fringe)		\$465 (404-1088)
TOTAL		\$9974	\$11,995

VI. ALIGNMENT WITH LEARNING OUTCOMES

The learning outcomes from this project align well with the first four (4) Student Learning Outcomes at the University of Minnesota, Twin Cities, as developed by the Provost's Council for Enhancing Student Learning (CSEL), listed at http://academic.umn.edu/provost/teaching/csel_outcomes.html.

Database-use Learning Outcome	Corresponding UMN Outcome (#)
A) Improved ability to identify, define, and solve current biodeterioration problems	1
B) Improved critical evaluation skills in real-world scenarios	2
C) Mastery of the contemporary knowledge base	3
D) Understanding of the context of biodeterioration problems within and across societies	4

Additionally, these four database learning outcomes align with Program Outcomes (e), (a), (j), and (h) of the Engineering Accreditation Commission of ABET, the Accreditation Board for Engineering and Technology, and also support the principal 'competency' focus areas of the Society for Wood Science and Technology (SWST). Both have accredited the Bioproducts and Biosystems Engineering (BBE) department and its curriculum.

VII. CONFLICT OF INTEREST

I/we certify that I/we do **do not**

have a conflict of interest as defined under the Board of Regents' Individual Business or Financial Conflict of Interest policy (http://www.umn.edu/regents/policies/administrative/Individual_COI.htm). If you selected "do," please describe the nature of the conflict of interest below.

VIII. OUTCOMES FROM PREVIOUS TEL GRANTS

Not Applicable

REFERENCES

¹ "Department of Pathology Online Case Studies" 1995. University of Pittsburgh School of Medicine, accessed 2/17/08 <http://path.upmc.edu/cases.html>

² "Interactive Case Study Companion to Robbins, *Pathologic Basis of Disease*." 1999. W.B. Saunders Corporation, accessed 2/17/08 <http://pathcuric1.swmed.edu/PathDemo/MainTofC.htm>

³ Schilling, J.S. "Biodeterioration Diagnostics Wiki." 2007. PBwiki.com, accessed 2/14/08 (www.rotbot.pbwiki.com)

⁴ Schilling, J.S. Biodeterioration Diagnostics Wiki: A collaborative network for case studies. International Symposium on Non-destructive Testing of Wood (NDT), Duluth, MN, September 11, 2007.

⁵ Zabel, R.A., Morrell, J.J., 1992. Wood microbiology: decay and its prevention. Academic Press, London and New York.