

**ENGINEERING AND TECHNOLOGY INDUSTRY COUNCIL  
RECOMMENDED INVESTMENTS FOR  
2001-2003**

**September 9, 2001  
Version 1.4**

**Executive Summary:**

This proposal describes how Oregon's engineering and computer science programs can take a large step towards meeting the Governor's goal of doubling the number of engineering and computer science graduates by 2005.

**Proposal.** This document proposes that \$20 million be allocated to the Oregon Engineering Education Investment Fund during the biennium starting July 1, 2001. These funds will be used to:

- Hire 23 new professors who will strengthen Oregon's ability to educate its young people and its workforce in the areas of engineering and computer science.
- Expand laboratories to serve the needs of the increased student population and increase the quality of the educational offerings.
- Enhance programs that will encourage young people to pursue majors in engineering and computer science, with a goal of touching thousands of middle school and high school students over the next two years.

These and related investments will result in an **increase** in the number of undergraduate degrees awarded of engineering and computer science programs by **92%** by 2005. In addition, the number of graduate degrees awarded will increase by **30%** by 2005.

**ETIC.** The Engineering Technology Industry Council (ETIC) includes executives from some of Oregon's top high technology employers, key public organizations and education partners.

- CH2M HILL, Inc.
- Electro Scientific Industries, Inc.
- ESCO Corporation
- Hewlett Packard Company
- Intel Corporation
- LSI Logic Corporation
- Novellus Systems
- Oregon Economic and Community Development Department
- Oregon State Board of Higher Education
- RadiSys Corporation
- Tektronix Inc.
- Xerox Corporation
- Eastern Oregon University
- Oregon Graduate Institute of Science and Technology at Oregon Health & Science University
- Oregon Institute of Technology
- Oregon State University
- Oregon University System, Chancellor's Office
- Portland State University
- Southern Oregon University
- University of Oregon
- Western Oregon University

**Process.** Each campus has done a careful analysis of how it can contribute to the goals described here. The members of ETIC have reviewed each campus's analysis for relevance to industry needs and its ability to contribute to a dramatic growth in degrees awarded. This review process has resulted in the set of investments initiatives described in this document. The members of ETIC are committed to the success of this effort.

**Proposal Structure.** The remainder of this proposal is divided into sections describing the undergraduate and graduate components of the proposed investments. An appendix provides summaries of the individual investments. ETIC is working on another proposal that will focus on

bringing Oregon into the top tier of engineering programs in the U.S. This latter proposal will be distributed at a later date.

*(Table 1: The effects of the proposed funding on degree production)*

(\$M)	State Funds	Industry Funds	Expected Follow-on Request	'98-'99 Degrees Granted	04-'05 Result Degrees Granted	% of Increase '99 to '05 Goal
Undergraduate	\$ 8.28	\$ 4.59	\$ 4.57	787	1513	92%
Graduate	\$ 10.69	\$ 6.97	\$ 3.79	388	504	30%
Research	\$ 1.02	\$ 1.02				
<b>Total</b>	<b>\$ 20.00</b>	<b>\$ 12.58</b>	<b>\$ 8.36</b>	<b>1175</b>	<b>2017</b>	<b>72%</b>

**Summary:**

1. \$8.36M invested in hiring additional engineering and computer science faculty.
2. \$3.38M invested in continuing support of faculty hired with previous OEEIF allocations.
3. \$1.02M matched dollar-for-dollar by industry to sponsor \$2.04M in research.
4. \$7.24M invested in supporting engineering and computer science programs.
5. Undergraduate Engineering and computer science degrees awarded increased by 92% and Graduate degrees increase 30% by the '04-'05 Academic Year.

**Industry Matching:**

Each campus is working with industry representatives to obtain donations, grants, and other support that will leverage the Oregon's investment in engineering and computer science education. We currently project that Oregon companies will invest about \$14 million during the '01-03 biennium. These investments will provide significant leverage to the state's investment and help assure that the combined investments will be made in areas that will produce measurable results and have the maximum impact on the growth of Oregon's economy.

The following table presents the 2001-03 proposed investments by campus and by degree type and shows the expected industry investments during the biennium as well as the state funding requests that are anticipated for the 2003-05 biennium.

<b>Investments by Campus and Degree Type Assuming \$20M</b>					
	<b>State Funds</b>			Industry contributions	Follow on Request
	\$M	Undergrad	Graduate		
OGI	0.00	2.43	2.43	0.61	0.72
OIT (1)	1.50	0.00	1.50	0.35	0.70
UO	0.70	1.45	2.15	3.05	0.67
OSU	2.90	4.00	6.90	3.20	1.25
PSU (2)	2.23	2.07	4.30	3.90	1.86
SOU	0.36	0.14	0.50	0.05	0.35
EOU	0.10	0.00	0.10	0.00	0.10
WOU	0.10	0.00	0.10	0.00	0.10
OCECS	0.40	0.60	1.00	0.40	0.00
Subtotal Investments	8.28	10.69	18.98	11.56	5.75
Research			1.02	1.02	
Total Investments	8.28	10.69	20.00	12.58	5.75

(1) Includes collaborations with OSU, WOU, EOU, and SOU

(2) Includes \$0.40M for programs operated by Saturday Academy, which is not part of PSU's College of Engineering and Computer Science

Table 8

## Undergraduate Category:

**Goal:** Increase the number of graduates by **92%** by 2005 (vs. the '98-'99 Academic year)

*(Table 2: The State Funds required in the 2001-03 biennium to meet undergraduate goals by campus.)*

	\$M	'98-'99 Academic Year		'04-'05 Academic Year		Increase '04-'05			\$K
		Actual		Forecast (1)		over '98-'99			
	State Funds	Student Credit Hours	Graduates '99	Student Credit Hours	Graduates '05	Student Credit Hours	Graduates '05 over '99	# of Incr. Degrees	State Funds Per Incr. Degree
EOU	\$ 0.10								
OCECS	\$ 0.40								
OIT & Collab. (2)	\$ 1.50	35,529	148	67,310	517	89%	249%	369	\$ 4.05
OSU	\$ 2.90	52,690	389	56,590	545	7%	40%	156	\$ 18.59
PSU (3)	\$ 2.23	20,785	157	27,287	246	31%	57%	89	\$ 20.54
SOU	\$ 0.36	5,876	34	7,600	95	29%	179%	61	\$ 5.90
UO	\$ 0.70	13,925	59	25,960	110	86%	86%	51	\$ 13.73
WOU	\$ 0.10								
<b>Total</b>	<b>\$ 8.28</b>	<b>128,805</b>	<b>787</b>	<b>184,747</b>	<b>1,513</b>	<b>43%</b>	<b>92%</b>	<b>726</b>	<b>\$ 11.41</b>

**Proposal:** \$7.78 million from the Oregon Engineering Education Investment Fund and \$4.63 million in industry matching funds will be used during the biennium starting July 1, 2001. These funds will be used to

- Hire additional faculty to support more undergraduate courses to be offered.
- Expand laboratories to support the additional students and courses.
- Enhance distance delivery capabilities to allow students to take elective courses from faculty on campuses other than their own.

### **Pre-College:**

- Enhance programs that will encourage young people to pursue majors in engineering and computer science. These programs include apprentices, clubs, and workshops (Saturday Academy, Opt for Coop and other pre-college outreach programs) that expose young people per year to the field of science and engineering and gives them insights into careers in these fields.
- The pre-college line items are exceptions when calculating a follow-on request, as these line-items are funded year-to-year and have no tuition or other revenue sources.

These and related investments will result in an increase in the number of undergraduate degrees award by engineering and computer science programs by **92%** by 2005.

### **Outcomes:**

- Expand undergraduate student credit hours by **43%** by the '04-'05 Academic Year.
- Increase the number of undergraduate engineering and computer science degrees awarded by 85% by the 04-'05 Academic Year.

1) This forecast assumes the anticipated industry contributions and follow-on investments shown in Table 4 on the next page.

2) Includes collaborations with OSU, WOU, EOU and SOU; see Table 4 on next page.

3) Includes \$400K pre-college investment via Saturday Academy; not counted in State Funds per Increment Degree; see Table 4 on next page.

**UNDERGRADUATE INITIATIVES:**

**Goal:** To increase capacity & graduates

**(Table 4: Undergraduate investments during 2001-03 biennium -- See Addendum 1 for program descriptions)**

Entity	Program	State Funds	Industry Contributions	Follow-on Requests
<b>OIT &amp; Collaborations (OGI, OSU, SOU, EOU and WOU)</b>				
OIT, SOU, EOU, WOU	OIT (colab.) Increasing Capacity of IT Degrees	\$ 0.35	\$ 0.15	\$ 0.10
OIT	OIT Pre-College Experiential Programs	\$ 0.30	\$ 0.07	\$ 0.30
OIT	OIT (with OSU) Extending Technology: A Business Retention and Expansion Pilot Project collaborative partnership OIT, OSU and OECCD	\$ 0.35	\$ 0.08	\$ 0.10
OIT	OIT: Information Technology Educational Programs for Working Students. * Certificates and Degrees	\$ 0.40	\$ 0.05	\$ -
OIT	Information Technology	\$ 0.10	\$ -	\$ -
	<b>Subtotal</b>	<b>\$ 1.50</b>	<b>\$ 0.35</b>	<b>\$ 0.50</b>
<b>UO</b>				
UO	Networking	\$ 0.40	\$ 0.05	\$ 0.23
UO	Expanded Capacity for Undergraduate Majors in CIS	\$ 0.30	\$ -	\$ 0.18
	<b>Subtotal</b>	<b>\$ 0.70</b>	<b>\$ 0.05</b>	<b>\$ 0.41</b>
<b>OSU</b>				
OSU	Continuation of 99-01 Growth Initiative	\$ 1.00	\$ -	\$ -
OSU	Growth I: learning Infrastructure Support	\$ 1.90	\$ 2.10	\$ -
OSU	Growth II: Add Degrees	\$ -	\$ -	\$ 1.25
	<b>Subtotal</b>	<b>\$ 2.90</b>	<b>\$ 2.10</b>	<b>\$ 1.25</b>
<b>SOU</b>				
SOU	Computer Science	\$ 0.36	\$ 0.04	\$ 0.35
SOU	<b>Subtotal</b>	<b>\$ 0.36</b>	<b>\$ 0.04</b>	<b>\$ 0.35</b>
<b>PSU</b>				
PSU	Faculty Continuation	\$ 0.63	\$ 0.75	\$ -
PSU	Enrollment Services	\$ 0.65	\$ 0.30	\$ 0.16
PSU	Lab Improvements	\$ 0.15	\$ 0.20	\$ -
PSU	Faculty for Growth	\$ 0.41	\$ 0.41	\$ 0.82
PSU	Precollege -- Saturday Academy portion	\$ 0.40	\$ -	\$ 0.88
	<b>Subtotal</b>	<b>\$ 2.23</b>	<b>\$ 1.66</b>	<b>\$ 1.86</b>
<b>WOU</b>				
WOU	Computer Science	\$ 0.10	\$ -	\$ 0.10
	<b>Subtotal</b>	<b>\$ 0.10</b>	<b>\$ -</b>	<b>\$ 0.10</b>
<b>EOU</b>				
EOU	Computer Science	\$ 0.10	\$ -	\$ 0.10
	<b>Subtotal</b>	<b>\$ 0.10</b>	<b>\$ -</b>	<b>\$ 0.10</b>
<b>OCECS</b>				
OCECS	Precollege - RFP portion	\$ 0.40	\$ -	\$ -
	Other programs (e.g. scholarships, fellowships)	\$ -	\$ 0.40	\$ -
	<b>Subtotal</b>	<b>\$ 0.40</b>	<b>\$ 0.40</b>	<b>\$ -</b>
	<b>Total</b>	<b>\$ 8.28</b>	<b>\$ 4.59</b>	<b>\$ 4.57</b>

## The Graduate Category

**Goal:** To provide and expand lifelong learning opportunities and enhance access to programs, to enhance quality and excellence of graduate programs.

To address the goal of increasing the graduate engineering and computer science degrees by 40% by 2005, the proposal calls for an investment of \$11.05M in State Funds and \$8.42M in industry funds during the 2001-03 biennium.

*(Table 5: The State Funds required in the 2001-03 biennium to meet graduate goals by campus.)*

	\$M	'98-'99 Academic Actual		'04-'05 Academic Year Forecast (1)		Increase '04-'05 over '98-'99			\$K
		Student Credit Hours	Degrees Awarded	Student Credit Hours	Degrees Awarded	Student Credit Hours	Degrees Awarded	# of Incr. Degrees	
OGI	\$ 2.43	4,508	89	5,024	112	11%	26%	23	\$ 105.65
OCECS (2)	\$ 0.60	600		2,000		233%			
OSU	\$ 4.00	12,870	164	15,354	208	19%	27%	44	\$ 90.91
PSU	\$ 2.07	8,685	109	11,749	132	35%	21%	23	\$ 90.09
SOU	\$ 0.14	72	5	400	12	456%	140%	7	\$ 20.00
Uof O	\$ 1.45	2,534	21	3,984	40	57%	90%	19	\$ 76.32
<b>TOTAL</b>	<b>\$ 10.69</b>	<b>29,269</b>	<b>388</b>	<b>38,511</b>	<b>504</b>	<b>32%</b>	<b>30%</b>	<b>116</b>	<b>\$ 92.17</b>

### Outcomes:

- Expand graduate student credit hours by **32%** by the '04-'05 Academic Year
- Increase the number of graduate engineering and computer science degrees awarded by **30%** by the 04-'05 Academic Year.

The table on the following page presents the 2001-03 proposed investments by campus and shows expected industry investments during the biennium as well as the state funding requests that are anticipated for the 2003-05 biennium.

1) This forecast assumes the anticipated industry contributions and follow-on investments shown in Table 7 on the next page.

2) Includes distance education investment. See Table 7 and Addendum 1.

## GRADUATE INITIATIVES

*(Table 7: Graduate investments by campus -- see Addendum 1 for program descriptions)*

Entity	Program	State Funds	Industry Contributions	Follow-on Requests
<b>OGI</b>				
OGI	Faculty Continuation	\$ 0.33	\$ 0.20	\$ -
OGI	Faculty Expansion	\$ 2.00	\$ 0.40	\$ 0.72
OGI	Webcast - OGI portion (w/PSU)	\$ 0.10	\$ 0.01	\$ -
	Subtotal	\$ 2.43	\$ 0.61	\$ 0.72
<b>UO</b>				
UO	MSI Graduate Internship Program	\$ 1.05	\$ 2.95	\$ 0.26
UO	Networking	\$ 0.40	\$ 0.05	\$ 0.23
	Subtotal	\$ 1.45	\$ 3.00	\$ 0.49
<b>OSU</b>				
OSU	Growth I: learning Infrastructure Support	\$ 1.00	\$ 1.10	\$ -
OSU	Growth II: Add Degrees	\$ 3.00	\$ -	\$ 1.25
	Subtotal	\$ 4.00	\$ 1.10	\$ 1.25
<b>PSU</b>				
PSU	Faculty Continuation	\$ 0.63	\$ 0.75	\$ -
PSU	Enrollment Services	\$ 0.22	\$ 0.10	\$ 0.16
PSU	Lab Improvements	\$ 0.44	\$ 0.60	\$ -
PSU	Faculty for Growth	\$ 0.79	\$ 0.79	\$ 0.82
	Subtotal	\$ 2.07	\$ 2.24	\$ 0.98
<b>SOU</b>				
SOU	Computer Lab	\$ 0.14	\$ 0.01	\$ 0.35
	Subtotal	\$ 0.14	\$ 0.01	\$ 0.35
<b>OCECS</b>				
OCECS	OMSE	\$ 0.60	\$ -	\$ -
	Subtotal	\$ 0.60	\$ -	\$ -
<b>Total</b>		<b>\$ 10.69</b>	<b>\$ 6.97</b>	<b>\$ 3.79</b>

# Research Category

**Goal:** Enhance research programs that can help drive Oregon's economic growth.

**Proposal:** \$1.02M will be allocated from Oregon Engineering Education Investment Fund (EEIF). These funds together with matching funds from industry will be used to enhance research programs on Oregon's campuses. Proposals for graduate internship initiatives will also be entertained. The following process will be used:

- During September 2001, a Request For Proposals (RFP) will be issued to all of Oregon's engineering and computer science programs. One of the key criteria established in the RFP will be that the proposed investment will be matched at least dollar-for-dollar by grants from companies with Oregon operations. These minimum matching funds must be in cash, although additional equipment and in-kind contributions from industry are also encouraged. Likewise, leveraging the proposed investment with federal and other out-of-state resources are encouraged but will not count towards the minimum industry match.
- By November 16, 2001, proposals will be received and screened by the Oregon College of Engineering and Computer Science for completeness and conformance to the criteria described in the RFP.
- The proposals will be reviewed for conformance to the criteria established in the RFP. They will be ranked based on the ratio of industry match to requested EEIF funds. When a particular company has endorsed multiple proposals and offered to provide matching funds to these proposals, that company will be asked to rank the proposals it has endorsed and this ranking will be taken in account when ranking the total set of proposals.
- At its meeting in December 2001, the Engineering Technology Industry Council will review a set of finalists and approve the awards to be made.
- By the end of December 2001, awards will be made to the research teams.
- The research will be conducted between January 2002 and June 2003.
- Each research team will participate in a mid-term workshop to held approximately November 2002. Each team will present a report that identifies the status and issues relating to their project.
- Final written reports will be due by July 31, 2003.

**Outcomes:**

- Expand industrially relevant research by about \$2 million dollars during the 2001-2003 biennium.
- Strengthen the relationships between Oregon's engineering and computer science programs and Oregon's technology companies.

(Table 9)

\$M	State Funds	Industry Match \$\$
RFP Process	\$1.02	\$1.02
<b>Total Research</b>	<b>\$1.02M</b>	<b>\$1.02M</b>