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ANNUAL REPORT



**OFFICE OF WATER PROGRAMS
CSUS FOUNDATION
CALIFORNIA STATE UNIVERSITY
SACRAMENTO**

1996 ANNUAL REPORT

for

**OPERATION OF WASTEWATER TREATMENT PLANTS
ADVANCED WASTE TREATMENT
INDUSTRIAL WASTE TREATMENT
TREATMENT OF METAL WASTESTREAMS
PRETREATMENT FACILITY INSPECTION
OPERATION & MAINTENANCE OF WASTEWATER COLLECTION SYSTEMS
WATER TREATMENT PLANT OPERATION
SMALL WATER SYSTEM OPERATION & MAINTENANCE
WATER DISTRIBUTION SYSTEM OPERATION & MAINTENANCE**



Summary	1993	1994	1995	1996	Total 1972 to Date
Manuals Sold	52,632	54,364	52,883	51,564	597,122
Enrollments	13,685	13,639	13,788	12,817	142,981
Completions	9,478	8,651	9,034	9,058	93,727
Students Dropped	2,170	3,563	2,404	2,364	24,846
University Credits	246	177	136	142	5,753
Tests Graded*	74,970	65,780	71,484	76,421	496,133

*Tabulation of tests graded did not begin until 1989.



Administered and Monitored by

**CSUS FOUNDATION
and
DEPARTMENT OF CIVIL ENGINEERING
KENNETH D. KERRI, PROGRAM DIRECTOR**

for the

U. S. ENVIRONMENTAL PROTECTION AGENCY

JANUARY 1997

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The purpose of this report is to provide a summary of the accomplishments of each program on an annual basis since its inception. All programs are operating on a financially self-sustaining basis.



OPERATION OF WASTEWATER TREATMENT PLANTS, (First Edition)

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>CE-12*</u>
1972	8,063	571	128	82	614
1973	5,747	1,569	1,490	51	389
1974	6,523	1,144	1,717	40	289
1975	4,543	804	655	55	164
1976	3,992	676	1,052	39	119
1977	3,280	570	248	70	166
1978	3,232	789	310	72	141
1979	3,180	881	191	82	103
1980	2,444	745	431	63	109
<u>1981</u>	<u>1,093</u>	<u>1,028</u>	<u>239</u>	<u>81</u>	<u>55</u>
Total	42,097	8,777	6,461**	68	2,149

Colleges and Universities: 301
Foreign Countries: 32

*CE = Civil Engineering

**Beginning in 1979, only persons who actually started a course and did not finish were counted as drops.

OPERATION OF WASTEWATER TREATMENT PLANTS

VOLUME I - Second, Third and Fourth Editions

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12A</u>
1980	1,190				19
1981	3,960	411	8	98	127
1982	3,976	731	181	80	98
1983	2,963	655	184	78	76
1984	3,347	1,087	171	86	66
1985	4,064	862	267	76	59
1986	4,534	896	155	85	82
1987	5,360	828	262	76	47
1988	7,591	1,172	326	78	37
1989	8,641	1,334	142	90	113
1990	9,338	1,561	361	81	43
1991	10,557	1,891	430	82	52
1992	11,701	2,091	596	78	66
1993	11,106	2,322	834	74	42
1994	10,298	1,988	1,254	61	42
1995	9,862	2,129	799	73	30
<u>1996</u>	<u>9,639</u>	<u>3,010</u>	<u>758</u>	<u>80</u>	<u>28</u>
Total	118,127	22,968	6,728	77	1,027

Colleges and Universities: 311
Foreign Countries: 58

VOLUME II - Second, Third and Fourth Editions

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12B</u>
1980	715				4
1981	3,023	182			47
1982	3,575	309	18	94	45
1983	2,438	381	33	92	39
1984	2,219	472	35	93	29
1985	2,827	454	91	83	25
1986	3,161	438	21	95	43
1987	4,134	604	72	89	20
1988	6,386	934	49	95	22
1989	6,038	883	51	95	27
1990	6,645	761	49	97	27
1991	7,478	1,249	89	93	47
1992	8,324	1,155	93	93	38
1993	7,769	1,133	138	89	35
1994	7,725	1,159	231	83	17
1995	6,875	989	148	87	13
<u>1996</u>	<u>6,654</u>	<u>931</u>	<u>184</u>	<u>83</u>	<u>12</u>
Total	85,986	12,034	1,302	89	490

Colleges and Universities: 271
Foreign Countries: 55

OPERATION OF WASTEWATER TREATMENT PLANTS

VOLUME III

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12C</u>
1980	428				1
1981	2,422	140			58
1982	1,898	213	35	86	25
1983	1,437	217	33	87	30
1984	1,537	430	24	95	12
1985	1,525	310	45	87	17
1986	2,266	291	30	91	29
1987	1,762	322	27	92	15
1988	<u>7</u>	<u>280</u>	<u>19</u>	<u>94</u>	<u>4</u>
Total	13,282	2,203	213	91	191

*In 1987 Volume III was revised and split into two manuals, *ADVANCED WASTE TREATMENT* and *INDUSTRIAL WASTE TREATMENT*.

ADVANCED WASTE TREATMENT

First, Second and Third Editions

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12E</u>
1987	960	7		100	
1988	3,199	340	1	100	7
1989	3,291	349	12	97	12
1990	3,583	531	32	94	20
1991	3,298	552	58	91	21
1992	3,912	647	72	90	21
1993	3,719	642	87	88	24
1994	3,642	559	170	77	12
1995	3,381	549	108	84	7
1996	<u>2,654</u>	<u>508</u>	<u>92</u>	<u>85</u>	<u>8</u>
Total	31,639	4,684	632	89	132

Colleges and Universities: 160
 Foreign Countries: 45

INDUSTRIAL WASTE TREATMENT
First Edition*

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12EF</u>
1987	941	3		100	
1988	2,273	132	1	100	5
1989	2,502	146	14	91	6
1990	3,473	268	30	90	21
1991	3,119	349	39	90	26
1992	3,480	347	56	86	20
1993	3,039	402	70	85	22
1994	2,237	313	116	88	7
1996					<u>3</u>
Total	21,064	1,960	326	91	110

Colleges and Universities: 94
Foreign Countries: 21

*In 1994 *INDUSTRIAL WASTE TREATMENT* was revised and split; Volume I was available in Fall 1994; Volume II was available Spring 1995.

VOLUME I - Second Edition

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-21A</u>
1994	1,105	17	0	100	0
1995	3,417	234	53	82	2
1996	<u>3,317</u>	<u>385</u>	<u>114</u>	<u>77</u>	<u>9</u>
Total	7,839	636	167	79	11

Colleges and Universities: 95
Foreign Countries: 33

VOLUME II - First Edition

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-21A</u>
1995	1,538	72	0	100	0
1996	<u>1,821</u>	<u>153</u>	<u>22</u>	<u>87</u>	<u>4</u>
Total	3,359	225	22	91	4

Colleges and Universities: 62
Foreign Countries: 27

TREATMENT OF METAL WASTESTREAMS
First and Second Editions

(Formerly *TREATMENT OF WASTEWATER FROM ELECTROPLATING, METAL FINISHING AND PRINTED CIRCUIT BOARD MANUFACTURING*)

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12D</u>
1986	1,281	98		100	18
1987	1,678	229	5	98	25
1988	2,077	283	4	99	13
1989	2,524	344	5	99	7
1990	2,798	332	27	92	22
1991	2,716	332	21	94	13
1992	2,688	393	24	94	25
1993	2,760	518	19	96	12
1994	3,003	495	61	89	13
1995	2,120	550	28	95	5
1996	<u>1,385</u>	<u>421</u>	<u>30</u>	<u>93</u>	<u>9</u>
Total	25,030	3,995	224	95	162

Colleges and Universities: 100
 Foreign Countries: 38

PRETREATMENT FACILITY INSPECTION
First and Second Editions

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-12G</u>
1988	1,355	48		100	
1989	1,135	310	8	97	6
1990	1,216	380	76	83	11
1991	1,027	237	56	81	10
1992	1,346	373	48	89	19
1993	1,043	292	57	84	13
1994	889	268	90	75	6
1995	888	234	59	80	3
1996	<u>871</u>	<u>271</u>	<u>64</u>	<u>81</u>	<u>5</u>
Total	9,770	2,413	458	84	73

Colleges and Universities: 75
 Foreign Countries: 36

**OPERATION & MAINTENANCE OF WASTEWATER
COLLECTION SYSTEMS**

First Edition

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-11</u>
1976	966	3			7
1977	1,093	281	8	97	77
1978	759	246	70	78	46
1979	633	179	83	68	34
1980	645	226	53	81	37
1981	680	218	37	85	46
<u>1982</u>	<u>601</u>	<u>265</u>	<u>42</u>	<u>86</u>	<u>23</u>
Total	5,377	1,418	293	83	263

Second Edition*

1983	583	25		100	3
1984	751	97	10	91	10
1985	1,103	147	16	90	13
1986	1,237	157	31	84	13
1987	1,108	329	90	79	9
1988	<u>0</u>	<u>121</u>	<u>33</u>	<u>79</u>	<u>4</u>
Total	4,782	876	180	83	52

*In 1987 the Second Edition was revised and split into two volumes.

VOLUME I - Third, Fourth and Fifth Editions

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-11A</u>
1987	546	2		100	
1988	1,803	189		100	3
1989	2,350	177	27	87	3
1990	3,100	367	47	89	15
1991	3,192	490	58	89	6
1992	3,516	428	96	82	18
1993	3,177	551	109	83	14
1994	3,137	520	183	74	7
1995	3,154	566	113	83	8
1996	<u>3,425</u>	<u>609</u>	<u>85</u>	<u>88</u>	<u>4</u>
Total	27,400	3,899	718	84	78

Colleges and Universities: 112
Foreign Countries: 46

VOLUME II - Third, Fourth and Fifth Editions

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-11B</u>
1987	338				
1988	1,413	65		100	1
1989	1,545	99	5	95	3
1990	2,330	171	3	98	9
1991	2,401	265	9	97	9
1992	2,660	254	10	96	12
1993	2,366	319	16	95	8
1994	2,054	270	47	85	6
1995	2,199	304	33	90	5
1996	<u>2,583</u>	<u>300</u>	<u>20</u>	<u>94</u>	<u>3</u>
Total	19,889	2,047	143	93	56

Colleges and Universities: 104

Foreign Countries: 45



WATER TREATMENT PLANT OPERATION

VOLUME I - First, Second and Third Editions

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-18A</u>
1983	1,469	31		100	10
1984	2,068	327	27	92	116
1985	2,344	355	82	81	69
1986	2,391	415	108	79	35
1987	2,972	422	143	75	29
1988	3,898	554	159	78	20
1989	5,044	717	160	82	22
1990	5,554	793	242	77	24
1991	5,507	936	317	75	22
1992	6,626	1,212	407	75	48
1993	6,675	1,444	489	75	30
1994	7,320	1,180	774	60	26
1995	6,767	1,458	577	72	24
1996	<u>7,065</u>	<u>1,509</u>	<u>525</u>	<u>74</u>	<u>23</u>
Total	65,700	11,353	4,010	74	498

Colleges and Universities: 214

Foreign Countries: 51

VOLUME II - First and Second Editions

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-18B</u>
1983	183				1
1984	1,331	140		100	9
1985	1,572	133	7	95	19
1986	1,467	163	21	89	6
1987	1,916	211	13	94	12
1988	2,301	266	23	92	9
1989	3,047	365	22	94	12
1990	3,298	500	29	95	10
1991	3,752	541	52	91	20
1992	4,114	651	66	91	23
1993	3,985	717	77	90	18
1994	4,378	743	156	83	16
1995	4,326	635	116	85	15
1996	<u>4,136</u>	<u>647</u>	<u>125</u>	<u>84</u>	<u>12</u>
Total	39,806	5,712	707	89	182

Colleges and Universities: 183

Foreign Countries: 46

WATER SUPPLY SYSTEM OPERATION

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-17</u>
1983	537				3
1984	1526	140	0	100	13
1985	1957	146	22	87	39
1986	1814	148	50	75	5
1987	<u>399</u>	<u>290</u>	<u>71</u>	<u>80</u>	<u>10</u>
Total	6,233	724	143	84	70

Colleges and Universities: 59

Foreign Countries: 9

*In 1987 *WATER SUPPLY SYSTEM OPERATION* was revised into a Second Edition and split into two manuals, *SMALL WATER SYSTEM OPERATION & MAINTENANCE* and *WATER DISTRIBUTION SYSTEM OPERATION & MAINTENANCE*.

SMALL WATER SYSTEM OPERATION & MAINTENANCE

Second and Third Editions

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-19</u>
1987	2,175	36		100	2
1988	2,115	177	9	95	5
1989	2,926	146	44	77	3
1990	3,090	266	62	81	9
1991	2,841	330	121	73	7
1992	3,641	314	119	73	14
1993	2,937	478	128	79	15
1994	3,766	497	251	66	16
1995	3,189	459	144	76	10
1996	<u>3,049</u>	<u>490</u>	<u>153</u>	<u>76</u>	<u>10</u>
Total	29,729	3,193	1,031	76	91

Colleges and Universities: 137

Foreign Countries: 47

WATER DISTRIBUTION SYSTEM OPERATION & MAINTENANCE

Second and Third Editions

<u>Year</u>	<u>Manuals Sold</u>	<u>Successful Completion</u>	<u>Dropped</u>	<u>Percent Completed</u>	<u>Registered CE-20</u>
1987	2,864	42		100	
1988	2,812	226	12	95	9
1989	2,933	197	38	84	13
1990	4,332	362	56	87	11
1991	3,961	589	100	85	16
1992	4,362	492	136	78	17
1993	4,056	660	146	82	13
1994	4,810	641	230	74	9
1995	4,918	715	178	80	14
1996	<u>4,965</u>	<u>686</u>	<u>192</u>	<u>77</u>	<u>12</u>
Total	40,013	4,610	1,088	81	114

Colleges and Universities: 132

Foreign Countries: 51

