

THE UNIVERSITY OF MICHIGAN  
INDUSTRY PROGRAM OF THE COLLEGE OF ENGINEERING

ANNUAL REPORT OF ENGINEERING PLACEMENT

John G. Young

July, 1966

IP-742

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OBSERVATIONS

June 6, 1965 - June 10, 1966

The volume of demand for technical graduates this year was evidently the greatest since the current shortage first developed about 1950. This was evidenced by large increases in recruiting activity, larger increases in starting salaries and an increase of 38% in the volume of offers reported in the nation-wide College Placement Council Survey. Demand seemed equally strong from both commercial industries and government contractors.

This general situation was still further aggravated here by the fact that we had about 20% fewer students interviewing for regular employment than last year, in spite of a 6% increase in the number of degrees granted. This is believed to be largely the result, directly or indirectly, of increased military service liability.

The proportion of graduates during the third term increased substantially, almost entirely at the expense of the second term, resulting in the number of first and second term graduates being the most nearly equal we have ever had. It is not anticipated, however, that this trend will lead to the development of a recruiting season during the third term.

The proportion of advanced degrees also increased markedly, and was almost equal to the total of B.S. degrees. Demand for advanced degrees continued to be strongest in the Aerospace and Electronics industries, as evidenced by premium salaries.

The proportion of graduates starting their first jobs in Michigan continued to increase to a total of 36%. This was mainly at the expense of other midwestern states, however, as the proportions going to the east and west coast remained substantially the same. There was also a notable increase in the proportion of graduates starting with small and medium-size employers at the expense of large organizations.

An even stronger market is indicated for next year by an increase of nearly 40% in advanced bookings for recruiting visits compared to an increase of about 10% at this time last year.

NUMBER OF DEGREES GRANTED

PROGRAM	B. S.			M. S.			Professional			Ph.D.		TOTAL IN EACH CLASS			TOTAL IN EACH PROG.	% IN EACH PROG.
	Aug '65	Dec '65	Apr '66	Aug '65	Dec '65	Apr '66	Aug '65	Dec '65	Apr '66	Dec '65	Apr '66	Aug '65	Dec '65	Apr '66		
Aerospace	10	21	23	5	7	19	3	2	1	2	2	18	32	45	95	9
Applied Math	4	15	24									4	15	24	43	4
Bioengineering				1	1	1						1	1	1	3	0
Chemical	13	18	18	15	6	8				6	5	28	30	31	89	9
Civil	10	17	19	12	10	21				10		22	37	40	99	10
Commun. Sci.				6	6	1				10	2	6	16	3	21	2
Electrical	26	41	45	37	33	37			1	14	7	63	88	90	241	23
Engrg. Mech.		2	3	5	5	12				7		5	14	15	34	4
Engrg. Physics	3	7	14									3	7	14	24	2
Industrial	11	13	22	10	19	14				2		21	34	36	91	9
Info. & Controls				3	3	2			2			3	3	4	10	1
Materials	1	1	2			2				2		1	5	2	8	1
Mechanical	17	30	35	21	14	22		1		10	2	38	55	59	152	14
Metallurgical		3	4			5				2		0	7	9	14	2
Meteor. & Ocean.			2	7	3	7				1	1	7	4	10	21	2
Nav. Arch. & Mar.	6	13	14	1	2	6				1	1	7	16	21	44	4
Nuclear				6	6	2		1		2	1	6	9	3	24	2
Science	2	7	15									2	7	15	24	2
TOTALS IN EACH CLASS	103	188	240	129	119	157	3	4	4	69	21	235	380	422	1037	100%
% IN EACH CLASS	19	36	45	32	29	39	28	36	36	77	23	23	37	40		
TOTALS AT EACH DEGREE LEVEL	531*			405*			11			9		1037				
% AT EACH DEGREE LEVEL	51%			39%			1%			9%		100%				

\*Thirty persons received two B.S. degrees and seven persons received two M.S. degrees during the year; therefore, the number of persons receiving B.S. degrees was 501 and receiving M.S. degrees was 398.

COMMENTS

Noteworthy changes in the proportion of degrees granted in the major categories this year as compared to last were:

Programs: No substantial changes, but a small increase in Civil and Electrical was counterbalanced by a small decrease in Aerospace and Mechanical.

Classes: A large increase in August graduates, from 13% to 23%, mostly at the expense of the May class, resulted in the December and May classes being very nearly equalized.

Degree Levels: An increase in the total number of degrees granted of 6% plus a decrease in the number of persons receiving two degrees from 54 to 37, resulted in an increase of 8% in the number of persons receiving degrees.

A decrease in B.S. degrees from 62% to 51% almost equalized them with the total of advanced degrees.

STUDENT AND ALUMNI ACTIVITY

NUMBER OF STUDENTS INTERVIEWING	BS	MS	PhD	Total
Citizens* for Regular Employment	252	169	66	487
Citizens for Summer Employment	284	39	18	341
Non-citizens	28	50	29	107
Non-engineers	11	35	5	51
Totals	575	293	118	986

NUMBER OF INTERVIEWS CONDUCTED

<u>For Regular Employment:</u>	Fall	Spring	Total
By Engineers, Citizens	2420	2759	5179
By Engineers, Non-citizens	215	486	701
By Non-engineers	43	67	110
Totals for Regular Employment	2678	3312	5990
<u>For Summer Employment:</u>	93	487	580
Totals for All Employment	2771	3799	6570

NUMBER OF INTERVIEWS, average	BS	MS	PhD	Total
per citizen accepting regular employment	12.3	10.8	7.2	11.3
NUMBER OF PLANT VISIT INVITATIONS, average	BS	MS	PhD	Total
per citizen accepting regular employment	5.1	7.4	6.7	6.0
NUMBER OF PLANT VISITS ACCEPTED, average	BS	MS	PhD	Total
per citizen accepting regular employment	3.0	3.7	4.0	3.3

INTERVIEWING BY Ph.D CANDIDATES

	<u>Degree Expected</u>		Total
	Before Sept. '66	After Sept. '66	
Number of Candidates Interviewing	69	43	112
Number of Interviews Taken	423	187	610
Average Interviews per Candidate	6.1	4.3	5.4

\* "Citizen" and "Non-citizen" refers to U.S. citizenship. Many non-citizens are available for temporary "practical training" employment only, usually for eighteen months following graduation.

POSTGRADUATE PLANS

	BS		MS		PhD		Total	
	No.	%	No.	%	No.	%	No.	%
Cit. Accepting Reg. Emplm't	149	51	79	44	26	76	254	50
To Continue in School	109	38	40	22	2	6	151	30
To Military Service	26	9	41	22	3	9	70	14
To Return to Previous Emplm't	3	1	19	10	1	3	23	4
Non-Cit. Ret'ng. to Home Country	3	1	3	2	2	6	8	2
Total	290	100	182	100	34	100	506	100

NUMBER OF ALUMNI UTILIZING PLACEMENT SERVICE . . . . . 102

COMMENTS

A very substantial drop of 21% in the number of citizens interviewing for regular employment is believed to be the result of increased liability for military service. The total number of interviews for both regular and summer employment also dropped substantially in spite of a 13% increase in the number of students interviewing for summer jobs.

The average number of interviews per student decreased from 12.1 last year to 11.3 in spite of the larger number of recruiting visits. The average number of plant visit invitations increased about 10%, but the number accepted decreased slightly.

The number of PhD candidates interviewing was about the same as last year, but the average number of interviews increased significantly from 3.7 to 5.4, possibly as a result of special procedures instituted this year for PhD's.

As anticipated, the proportion expecting immediate military service increased, but only from 10% to 14% which was still less than the 17% of the year before.

The number of alumni utilizing our placement continued to drop to a new low, probably as a result of the extreme demand conditions.

EMPLOYER ACTIVITY

NUMBER OF EMPLOYERS SCHEDULING INTERVIEW VISITS	Fall	Spring	Total
	348	451	519*
NUMBER OF EMPLOYERS VISITING FOR THE FIRST TIME THIS YEAR			120

NUMBER OF INTERVIEW VISITS

<u>By Industries:</u>	Visits Scheduled	Visits Canceled	Visits Completed	
			No.	%
Aircraft, Space Veh., & Components	71	2	69	10
Automotive & Mechanical Equipment	136	33	103	15
Chemical, Drugs, & Allied Products	140	24	116	17
Const. & Bldg. Mat'ls. Mfgs.	23	4	19	3
Elect. Machinery & Equipment	66	8	58	8
Electronics & Instruments	61	12	49	7
Food & Beverage Processing	14	4	10	1
Glass, Paper, Pkg., & Allied Products	29	5	24	3
Metal & Metal Products	76	20	56	8
Petro. & Allied Prod. (inc. Nat. Gas)	33	1	32	5
Res. &/or Consulting Organizations	38	9	29	4
Tire & Rubber	16	2	14	2
Utilities-Public (inc. Trans.)	44	6	38	5
State & Local Government	21	7	14	2
Federal Government	61	2	59	8
Educ. or Res. Related to Education	13	1	12	2
Totals	842	140	702	100

By Size of Employer's Organization:

	Visits Scheduled	
	No.	%
Large (Over 5000 employees)	523	62
Medium (Between 500 and 5000 employees)	249	30
Small (Less than 500 employees)	70	8
Totals	842	100

NUMBER OF OFFERS, AVERAGE	BS	MS	PhD	Total
per citizen accepting regular employment	4.9	5.8	5.4	5.3

NUMBER OF EMPLOYERS REQUESTING APPLICANTS BY MAIL

Students for Regular Employment . . . . .	250
Students for Summer and Part-time . . . . .	82
Alumni with Experience . . . . .	720

\* This total is the number of separate employers who scheduled visits during the year. Since more than half of these scheduled more than one visit, this total is not equal to the sum of the numbers of employers for fall and spring.

COMMENTS

Employer activity reached an all-time high with an increase of 17% in the number of employers scheduling visits and 15% in the number of visits scheduled. Much of the increase was accounted for by an increase in the number of "first-time" employers from 76 to 120.

An increase of 47% in the number of cancellations, mostly due to insufficient student appointments, resulted in an increase of only 11% in the number of visits completed, however.

Aerospace and Petroleum showed some increase in their proportion of visits, while Chemicals, Drugs, and Allied Products decreased by 3% of the total.

The proportion of large employers again declined, bringing it back to the level of three years ago and indicating increasing activity of smaller organizations.

The average number of offers per student increased by about one offer at all degree levels, reflecting the general increase in the volume of offers this year.

The number of requests received by mail for new graduates and summer candidates both declined, probably because more employers made personal visits to the campus, but there was a large increase of 23% in the requests for alumni with experience.



STARTING SALARIES ACCEPTED\*

BY PROGRAMS	BS		MS		PhD	
	No.	Aver.	No.	Aver.	No.	Aver.
Aerospace	16	\$663	1	\$866	1	\$1078
Applied Math.						
Chemical	14	661	8	803	3	1117
Civil	13	649	5	751		
Communication Science						
Electrical	40	675	21	807	3	1217
Engineering Mechanics			4	860		
Engineering Physics	4	636				
Industrial	14	670	7	809		
Information & Controls			2	812		
Materials	1	650	1	790	1	1200
Mechanical	19	672	14	806	2	1330
Metallurgical					2	1059
Meteorology & Oceanography	1	609				
Naval Arch. & Marine	8	659				
Nuclear			2	760	4	1094
Science	5	686				
Totals	136	\$668	65	\$804	16	\$1151

BY INDUSTRIES	BS		MS		PhD	
	No.	Aver.	No.	Aver.	No.	Aver.
Aircraft, Space Vehicles, & Components	30	\$667	8	\$831	3	\$1143
Automotive & Mech. Equip.	21	667	12	790	1	1025
Chem., Drugs, & Allied Prod.	12	670	5	770	1	1185
Constr. & Bldg. Mat'ls. Mfrs.	2	674	3	765	1	1200
Elect. Machinery & Equip.	10	671	2	891	1	1125
Electronics & Instruments	24	675	17	820	2	1238
Food & Beverage Processing	1	700				
Glass, Paper, Pkg. & Allied Products	2	650				
Metal & Metal Products	5	657	1	750	2	1059
Petro. & Allied Prod. (inc. Nat. Gas)	8	670	4	799	1	1125
Res. &/or Consulting Organ's.	11	650	11	795	4	1188
Tire & Rubber	1	655				
Utilities-Public (inc. Trans.)	8	653	2	835		
Totals	136	\$668	65	\$804	16	\$1151

SPECIAL CATEGORIES	BS		MS		PhD	
	No.	Aver.	No.	Aver.	No.	Aver.
State & Local Government	1	\$625	2	\$699		
Federal Government	11	594	6	775	1	\$ 880
Educ. or Res. Related to Educ.	3	645	3	743	15	1000
Double Degrees	6	708				

\* By citizens for regular employment, no salaries reported by Prof. degree grads

COMMENTS

Starting salaries increased nearly twice as much as last year at all degree levels: 4.7% for B.S., 4.0% for M.S., and 6.0% for Ph.D.'s. These increases at the B.S. and M.S. levels are less than the 5.7% and 5.0%, respectively, reported by the nation-wide College Placement Council Survey, but the Ph.D. increase was twice as much as the 3.0% reported by CPC. These are not considered to be large differences in the averages themselves, however, in view of the relatively small numbers on which our report is based.

Comparing the various programs at the B.S. level, Electrical resumed the lead at \$675 with Chemical, the leader last year, dropping to fifth place among the major programs with \$661. In the national CPC survey, however, Chemical is still in the lead at \$682 with Aerospace and Electrical running very close at \$681 and \$679 respectively. At the advanced degree levels, there was very little difference between the major programs except for Civil which continues to show a substantially lower differential for the M.S. degree.

Considering industries, differences at the B.S. level were the smallest ever reported, with a spread of only about \$20 per month. Somewhat larger differences were indicated at the M.S. level, however, with Aerospace and Electronics leading at \$831 and \$820 respectively, followed by Petroleum, Automotive, and Chemical in that order. This again emphasizes the high premium for the M.S. degree in the space and defense industries.

Government, Education, and Double Degrees are shown in a separate table for the first time this year. Government salaries were substantially lower than industry, except for the M.S. level with the Federal Government. Education, although still lower than industry, seems to be becoming quite comparable, especially at the Ph.D. level. Double degrees were reported only at the B.S. level this year, but showed a substantial differential of \$40 per month compared to the average of single degrees.

SUMMER JOB SALARIES ACCEPTED

1966

<u>PROGRAMS</u>	<u>Underclassmen</u>		<u>M.S. Candidates</u>	
	<u>No.</u>	<u>Average</u>	<u>No.</u>	<u>Average</u>
Aerospace	3	\$615	1	\$673
Applied Math				
Bioengineering				
Chemical	22	564	4	626
Civil	3	562		
Commun. Sci.				
Electrical	6	565	1	750
Engrg. Mech.				
Engrg. Physics	3	555		
Industrial	8	533	1	500
Info. & Controls				
Materials				
Mechanical	7	586	5	662
Metallurgical	2	575		
Meteor. & Ocean.				
Nav. Arch. & Mar.	1	575		
Nuclear				
Science	3	576		
Combined	2	633		
<b>TOTALS</b>	<b>60</b>	<b>\$567</b>	<b>14</b>	<b>\$640</b>

COMMENTS

No special survey was made to obtain summer job salary data, and therefore the number of jobs reported is not an indication of the number of jobs available; however, the average amounts indicate that salaries for summer training positions have increased more than 10% per year during the past two years since the last survey was made. This is more than twice as much as the increase in starting salaries for regular employment and seems to reflect an increasing emphasis on summer training.

POSITIONS ACCEPTED

(By citizens for regular employment)

<u>BY LOCATION</u> (265 reported)		<u>BY TYPE OF WORK</u> (260 reported)	
	<u>%</u>		<u>%</u>
Michigan	36	Training Program	26
Other Midwest	17	Research & Development	29
East	25	Design or Systems Engrg.	27
West	16	Operations or Production	12
Other	6	Sales	3
	<u>100</u>	Teaching	3
			<u>100</u>

<u>BY TYPE OF INDUSTRY</u> (265 reported)			
	<u>%</u>		<u>%</u>
Aircraft, Space Vehicles, & Components	18	Metal & Metal Products	3
Automotive & Mechanical Equip.	14	Petro. & Allied Prod. (inc. Nat. Gas)	5
Chem., Drugs, & Allied Prod.	8	Res. &/or Consulting Organ's	10
Constr. & Bldg. Mat'ls. Mfrs.	2	Tire & Rubber	1
Elect. Machinery & Equip.	7	Utilities-Public (inc. Trans.)	4
Electronics & Instruments	15	State & Local Government	2
Food & Beverage Processing	0	Federal Government	5
Gl., Paper, Pkg., & Allied Prod.	1	Education or Res.	5
			<u>100</u>

<u>BY SIZE OF EMPLOYER'S ORGANIZATION</u> (256 reported)	
	<u>%</u>
Large (More than 5000 employees)	51
Medium (Between 500 and 5000 employees)	31
Small (Less than 500 employees)	18
	<u>100</u>

COMMENTS

The proportion of graduates starting in Michigan continued to increase by 5% this year at the expense of "Other Midwest," with the proportion to other areas remaining substantially unchanged.

Last year's increase in Training Program starts was nullified by an almost equal decrease this year indicating that these changes may be normal fluctuations rather than trends.

After a substantial decrease last year, Aerospace maintained its proportion, and substantial gains were indicated for Electronics, and Research at the expense of Automotive, Chemicals, and both non-metallic and metallic materials and products.

The proportion starting with large firms dropped conspicuously from 63% to 51% with gains of 4% and 8% respectively for medium and small employers. This was the largest variation experienced for several years, and may indicate increasing activity of smaller organizations.