OUTCOME ASSESSMENT GUIDELINES
CHEMISTRY MAJORS
1996 UPDATE

EFFECTIVE: October 11, 1996

MAJOR FIELD ASSESSMENT PLAN
B. S. CHEMISTRY

The mission of Southeastern Louisiana University is to meet the education and cultural needs, primarily of Southeast Louisiana, to disseminate knowledge and to facilitate life-long learning through quality instruction, research and service in a safe, student-centered environment.

The purpose of the B.S. in Chemistry is to...

Goal 1

To provide student with strong knowledge of the field of chemistry.

A. Expected Outcome

Graduating seniors should have an adequate knowledge of inorganic, analytical, instrumental, organic, and physical chemistry.

Assessment

The ETS's MFAT in chemistry will be given to all chemistry majors late in the spring. Annual testing is expected to show individual improvement. By the spring semester of their senior year, 75% of seniors should improve their score by 25 percentile points.

B. Expected Outcome

Majors should feel that they have been given every reasonable opportunity to learn and grow as a chemist and that the chemistry faculty were concerned about their progress and performance and made themselves available to offer assistance.

Assessment

a. An instrument will be developed within the Department to assess students attitudes toward the faculty and the curriculum.

b. On the SLU Exit survey, 80% of the graduates will rate the Department as satisfactory or better.

c. 80% of the employees/graduate schools will rate graduates of the chemistry degree program as satisfactory of better in follow-up surveys and/or informal conversations.

Goal 2

To provide chemistry majors with the skills needed to conduct research

A. Expected Outcome

Graduating seniors should have problem solving skills.

Assessment

a. The ETS's MFAT in chemistry will be given to all chemistry majors late in the spring semester. Annual testing is expected to reveal the student's improvement. By the spring semester of their senior year 75% of seniors should improve their scores by 25 percentile points. This test is a partial evaluation of problem solving skills.

b. Eighty percent of students will score satisfactory or better on a departmental assessment of skills as demonstrated by their performance in 200 - 400 level courses. An evaluation instrument has been devised by the department and a minimum of ½ the chemistry faculty must complete each students evaluation.

B. Expected Outcome

Graduating chemistry seniors should be competent in laboratory methods.

Assessment

Eighty percent of students will score satisfactory or better on a departmental assessment of skills as demonstrated by their performance in 200 - 400 level courses. An evaluation instrument has been devised by the department and a minimum of ½ the chemistry faculty must complete each students evaluation.

C. Expected Outcome

Graduating seniors should be able to communicate effectively both verbally and in writing in the field of science.

Assessment

Eighty percent of students will score satisfactory or better on a departmental assessment of skills as demonstrated by their performance in 200 - 400 level courses. An evaluation instrument has been devised by the department and a minimum of ½ the chemistry faculty must complete each students evaluation.

CHEMISTRY 1996

SOUTHEASTERN LOUISIANA UNIVERSITY
DEPARTMENT OF CHEMISTRY AND PHYSICS
ASSESSING CHEMISTRY MAJORS LEARNING

Prepared by
Samira Barghouthi

The Department of Chemistry has general guidelines that are used to asses student learning. These guidelines are designed based on the following questions.

I) What are we preparing our Chemistry majors for

* Medical School
* Graduate School
* Industrial job
* Chemistry Education

II)Why do we need to assess students' learning?

III) How do we know if our assessment methods are effective?

IV)Are we using the results of assessment to enhance the quality and preparedness of our chemistry graduates?

Our assessment plan consists, but is not restricted, of the following:

1. We are assessing chemistry majors
2. Does our curriculum meet the requirement of the American Chemical Society (ACS) for the B.S. with ACS accreditation.
3. How well are our students prepared in the following categories

a. **Content knowledge**: The MFAT is used for this purpose

b. **Skills proficiency**: There are different methods to monitor students skills. Each student's skill is evaluated by at least one of the following:

1. In some courses a final practical project is prepared by each student as a part of the course. Each student works independently on a chemistry project. A final report is submitted with experimental results and discussion. The results of this project are also presented in an oral presentation to an audience of faculty and students.
2. Some students are involved in preparing and setting-up chemistry laboratory.
3. Students who show interest in continuing their graduate studies are advised and minored into

summer jobs at different graduate schools.

4. Some students have the chance to work independently on research projects with one of the chemistry faculty.

5. All Chemistry majors skills, in general, are tested in the different laboratory courses they take during the four year period in the Chemistry Department.

c. **Critical thinking:** Senior classes involve problem solving skill training. In these classes students are presented with sets of problems that they work on as groups. By conducting such exercises the students learn problem solving skills as well as collaboration with other members of the group. It is vital that students learn not only how to solve science problems but also to be able to discuss their opinion and defend their solutions to a certain problem in a group setting.

d. **Writing Skills:** This is a continued process and is based on laboratory reports and scientific critiques of published science literature.

e. **Attitudes/Values..etc & Satisfaction with the Program:** Graduating Chemistry majors complete a student survey of satisfaction. These surveys are also used to assess the Department in general.

f. **Career Success of Graduates:** We write to our graduates and try to keep a record of their performance in graduate schools, medical school, industries...etc.

g. **Effectiveness of the Chemistry Program:** The indicator here is the number of graduates that achieved their goal post graduation. By the senior year most students would have post-graduation plans. Records should be kept of whither the graduate was able to achieve his/her goal.

1. Who do we collect the data from? From exiting seniors, alumni, faculty and correspondence with graduates.

2. How do we use the data?

*Internal discussion

*Process improvement

*Program development

*Reports to SACS

3. How often do we collect data depends on the category of assessment. This could vary from

one-time projects to annual evaluation.

Assessing student learning in chemistry is a daily process. Student spend a large amount of their time a working in the laboratory. Faculty members observe and evaluate these students as a part of their performance in laboratory courses. Observing how a student conducts her- or himself is the best tool to measure students' learning and preparedness. Thus we as faculty are able to be with students one on one; the excellent student is rewarded, the good is encouraged to aim higher, the week is helped to reach a better understanding of the subject matter both theoretical and experimental and are observed to improve as they progress towards senior years.

MAJOR FIELD TEST RESULTS

AND

ANALYSIS FOR THE LAST FIVE YEARS

1992-1996

CONCLUSION:

General analysis of MFAT results during the last five years period of 1992-1996 indicate that students show tremendous progress and improvement by the time they graduate with a degree in chemistry. This monitoring process was only possible when students were allowed to take the MFAT every year. However this process was discontinued in 1995.

As the number of graduating chemistry majors is usually less than five, it seems of relevance to the assessment of this program to monitor students' progress annually rather than monitoring their national ranking.

National ranking could be used but one has to keep in mind the "Open Enrollment " policy of Southeastern Louisiana University. In some situations students' performance on the MFAT was much lower than the National average. Although this is not a good sign it does not reflect students' progress in our chemistry program; it only shows students' preparedness in chemistry as compared to National average.

	Physics	Chem.Ed.		Chem.Ed.		
	Student1	Student2	Student3	Student4	Student5	Student6
Total Score	135	137	138	139	147	157
%Below	24	21	24	27	49	75

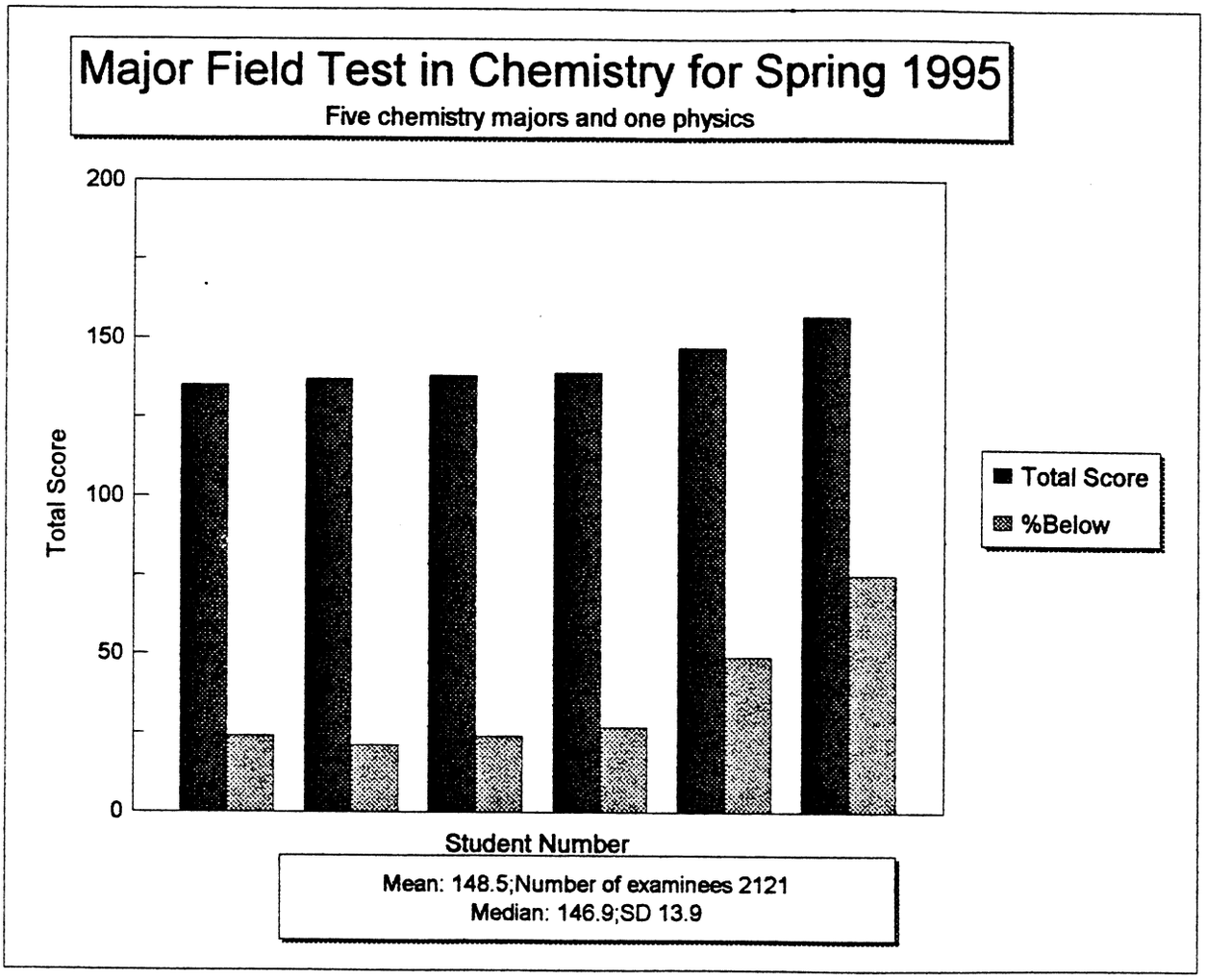


Table 3A

Spring 95

Major Field Test in **Chemistry**
Individual Student Total Score Distribution
Seniors Only: 1991 - 1994 Data

Total Score (Range 120 - 200)	%Below
186 - 200	99
185	98
184	98
183	98
182	98
181	97
180	97
179	97
178	96
177	96
176	96
175	95
174	95
173	94
172	94
171	93
170	92
169	91
168	90
167	89
166	87
165	86
164	85
163	84
162	82
161	81
160	80
159	78
158	76
157	75
156	73
155	70
154	67
153	65
152	63
151	60
150	57
149	55
148	52
147	49
146	46
145	43
144	39
143	36
142	33
141	30
140	30
139	27
138	24
137	21
136	18
135	16
134	14
133	11
132	10
131	7
130	6
120 - 129	5

Number of Examinees	2121
Mean	148.5
Median	146.9
Standard Deviation	13.9

Total Score and Subscores are reported as *scaled scores*.

% Below based on percent below the lower limit of the score interval.

Table 13A

Spring 95

Major Field Test in Physics
Individual Student Total Score Distribution
Seniors Only: 1991 - 1994 Data

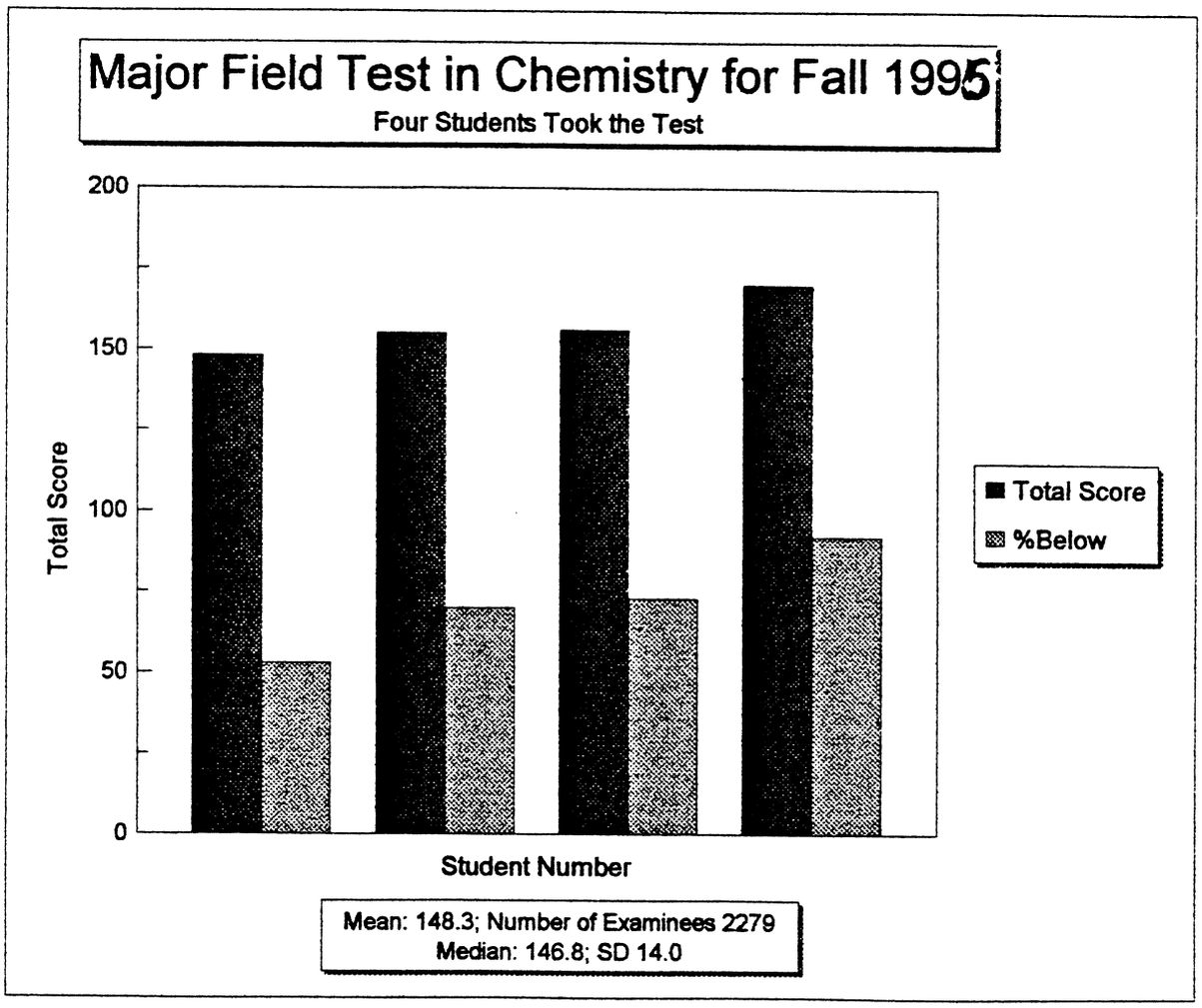
Total Score (Range 120 - 200)	%Below
187 - 200	99
183 - 186	98
181 - 182	97
179 - 180	96
178	95
176 - 177	94
175	93
173 - 174	92
172	91
170 - 171	90
169	89
167 - 168	86
166	85
164 - 165	84
163	81
161 - 162	79
159 - 160	77
158	75
156 - 157	73
155	70
153 - 154	68
152	64
150 - 151	62
149	58
147 - 148	55
146	51
144 - 145	46
143	42
141 - 142	40
139 - 140	35
138	31
136 - 137	27
135	24
133 - 134	20
132	16
130 - 131	13
129	10
127 - 128	8
126	6
120 - 125	5

Number of Examinees	844
Mean	147.4
Median	145.4
Standard Deviation	15.9

Total Score and Subscores are reported as *scaled scores*.

% Below based on percent below the lower limit of the score interval.

	Student1	Student2	Student3	Student4
Total Score	148	155	156	170
%Below	53	70	73	92



ETS MAJOR FIELD TESTS

DEPARTMENTAL SUMMARY
ASSESSMENT INDICATORS

CHEMISTRY
UTION: SOUTHEASTERN LOUISIANA UNIVERSITY

REPORT DATE: MAY 1995

	MEAN PERCENT CORRECT	SE*	00 20 40 60 80 100
SSMENT CATOR 1	38.8	2.9	+--X--+
SSMENT CATOR 2	40.0	3.9	+---X---+
SSMENT CATOR 3	43.0	4.3	+---X---+
SSMENT CATOR 4	31.8	6.3	+-----X-----+

ENTS RESPONDING TO < 50% OF THE ITEMS IN ONE OR BOTH SECTIONS: 0
ENTS IN FREQUENCY DISTRIBUTIONS: 5
ENTS TESTED: 5

SSMENT INDICATORS
1: ANALYTICAL CHEMISTRY
2: INORGANIC CHEMISTRY
3: ORGANIC CHEMISTRY
4: PHYSICAL CHEMISTRY

ssment indicator scores are shown as the mean percent correct (X). The dotted
s on each side of the mean (X) represent a confidence band of approximately
(plus or minus two standard errors of the mean). See the comparative data
e for an explanation of the confidence bands.

E = Standard error of the mean based on this department's data.

Table 3A

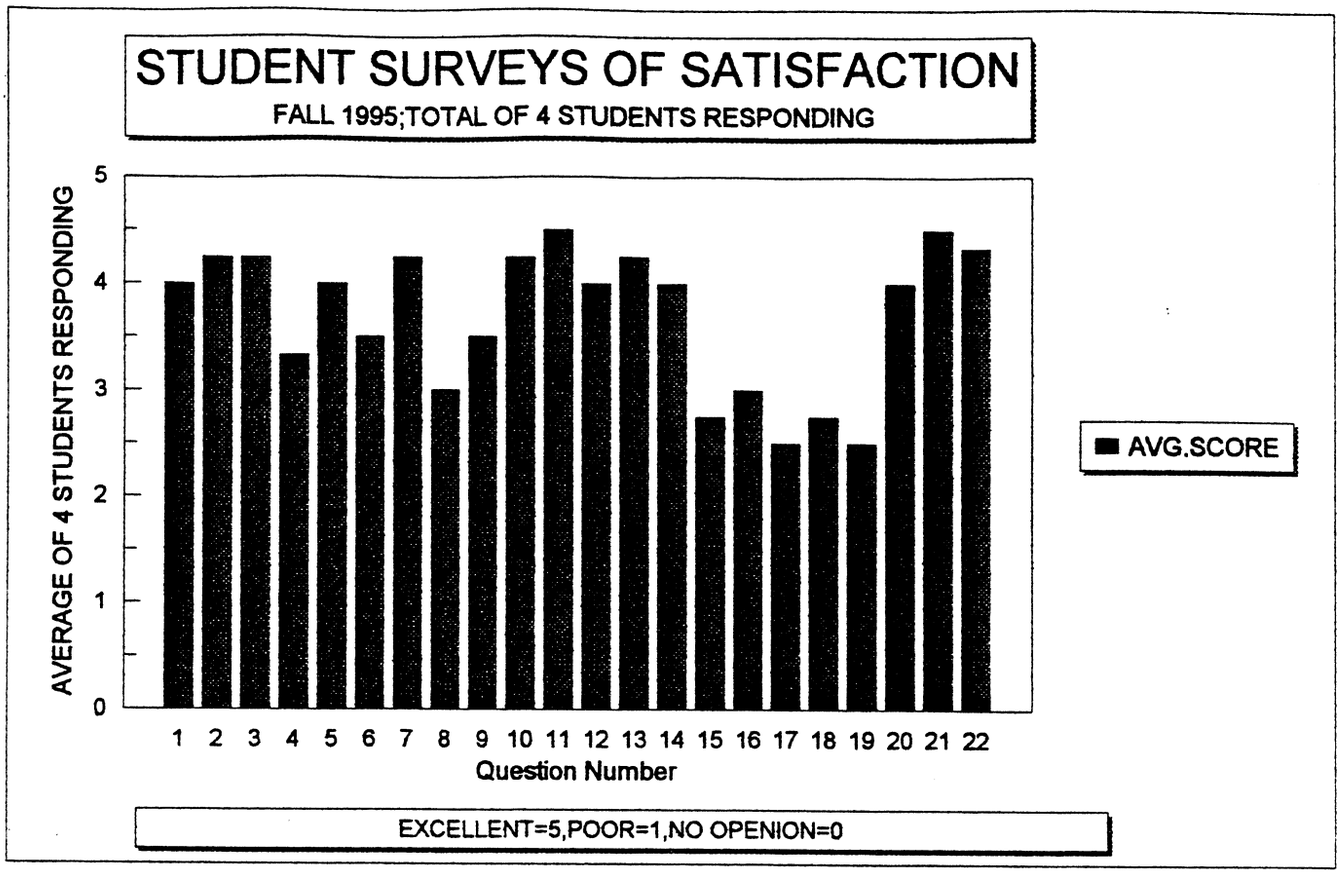
Fall 95

Major Field Test in Chemistry
Individual Students Total Score Distribution
Seniors Only - - 1992 - 1995 Data

Total Score (Range 120 - 200)	%Below
185 - 200	99
184	98
183	98
182	98
181	97
180	97
179	97
178	96
177	96
176	96
175	95
174	95
173	94
172	93
171	93
170	92
169	91
168	90
167	89
166	87
165	86
164	85
163	84
162	82
161	81
160	80
159	78
158	77
157	75
156	73
155	70
154	68
153	66
152	63
151	61
150	58
149	56
148	53
147	49
146	46
145	43
144	40
143	37
142	34
141	30
140	30
139	27
138	24
137	22
136	19
135	16
134	14
133	12
132	10
131	8
130	6
120 - 129	5

Number of Examinees	2279
Mean	148.3
Median	146.8
Standard Deviation	14.0

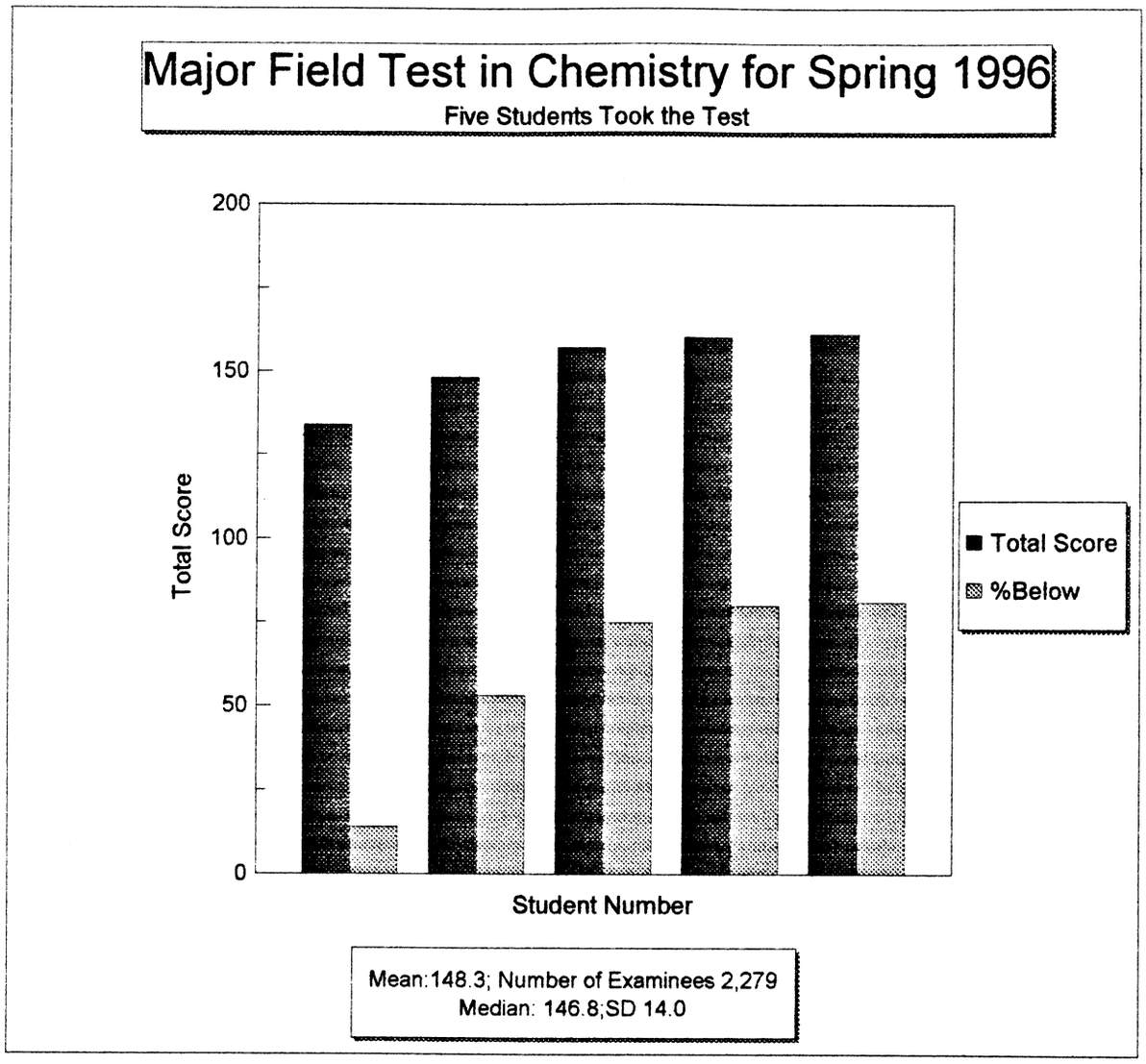
Total Score and Subscores are reported as *scaled scores*.
% Below based on percent below the lower limit of the score interval.



1	Availibility of academic advisor
2	Willingness of advisor to help
3	Quality of curricular advising in major
4	Quality of career advising in majorClarity of degree requirements for major
5	Clarity of degrre requirements for major
6	Organization of the curriculum for major
7	Adequacy of preparation 100-200 courses for upper level
8	Availability of required courses in major
9	Availability of desired courses
10	Professional competence of faculty in major
11	Overall quality of instruction 100-200 level in major
12	Overall quality of instruction 300-400 level in major
13	Fairness of grading policies in major courses
14	Opportunities for interaction with faculty
15	Opportunities for majors to participate in research
16	Departmental faculty concern for academic progress
17	laboratory facilities related to major
18	Classroom facilities related to major
19	Library facilities related to major
20	Attitude of departmental chair toward majors
21	Helpfulness of office and support personnel
22	Overall departmen quality

ay be needs tobe Rephrased

	Student1	Student2	Student3	Student4	Student5
Total Score	134	148	157	160	161
%Below	14	53	75	80	81



ETS MAJOR FIELD TESTS

DEPARTMENTAL SUMMARY
ASSESSMENT INDICATORS

TEST: CHEMISTRY
INSTITUTION: SOUTHEASTERN LOUISIANA UNIVERSITY
REPORT DATE: JUNE 1996

	MEAN PERCENT CORRECT	SE*	00 20 40 60 80 100
ASSESSMENT INDICATOR 1	58.8	6.6	+------X------+
ASSESSMENT INDICATOR 2	43.4	3.7	+---X---+
ASSESSMENT INDICATOR 3	47.6	9.7	+---------X---------+
ASSESSMENT INDICATOR 4	38.8	2.7	+--X--+

STUDENTS RESPONDING TO < 50% OF THE ITEMS IN ONE OR BOTH SECTIONS: 0
STUDENTS IN FREQUENCY DISTRIBUTIONS: 5
STUDENTS TESTED: 5

ASSESSMENT INDICATORS
1: ANALYTICAL CHEMISTRY
2: INORGANIC CHEMISTRY
3: ORGANIC CHEMISTRY
4: PHYSICAL CHEMISTRY

Assessment indicator scores are shown as the mean percent correct (X). The dotted lines on each side of the mean (X) represent a confidence band of approximately 95% (plus or minus two standard errors of the mean). See the comparative data guide for an explanation of the confidence bands.

* SE = Standard error of the mean based on this department's data.

MAJOR FIELD TESTS

DEPARTMENTAL SUMMARY
TOTAL TEST AND SUBSCORES

TEST: CHEMISTRY
INSTITUTION: SOUTHEASTERN LOUISIANA UNIVERSITY

REPORT DATE: JUNE 1996

TOTAL TEST

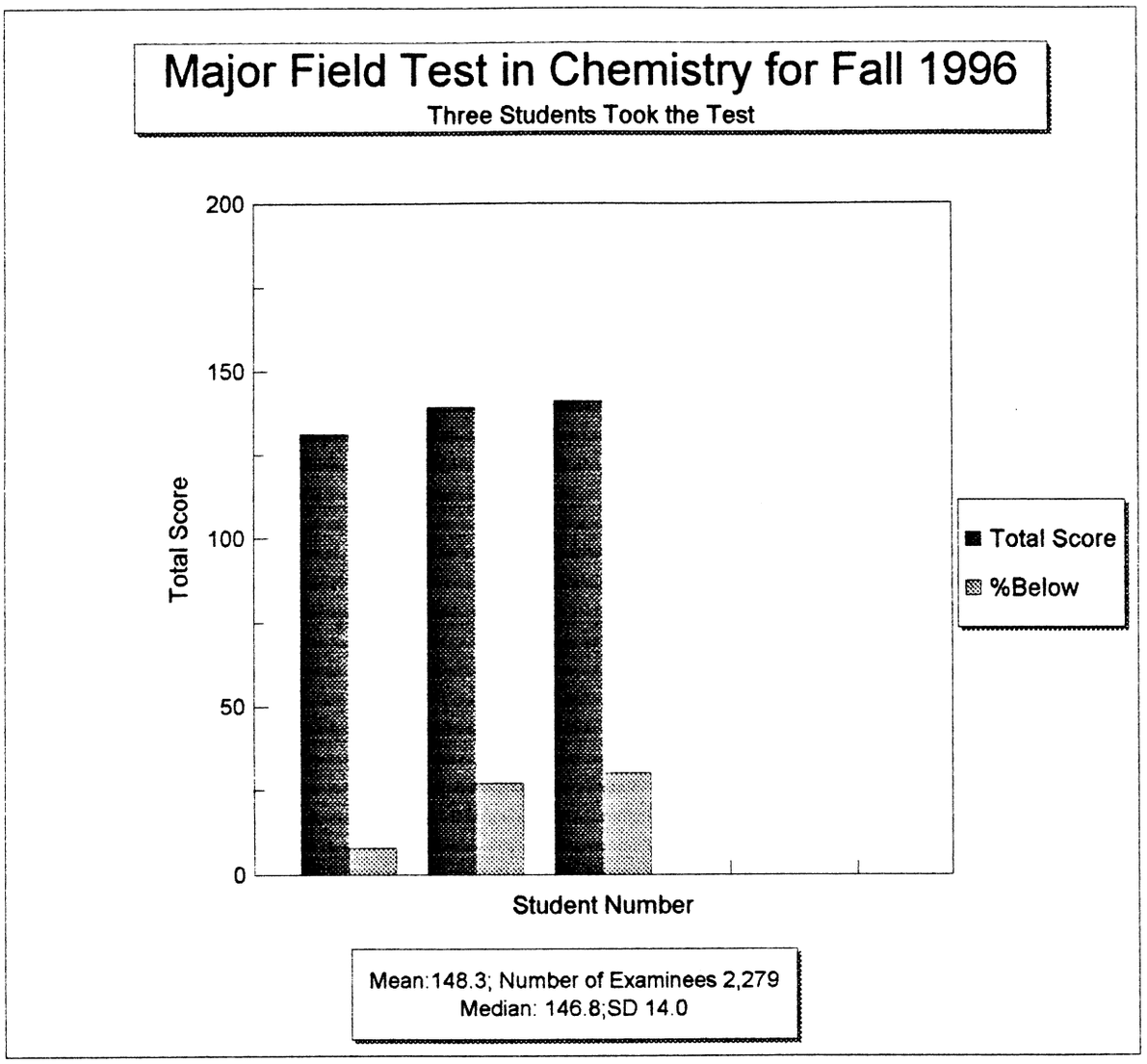
SCALE SCORE	NO. OF STUDENTS	%ILE RANK*
200	0	100
195-199	0	100
190-194	0	100
185-189	0	100
180-184	0	100
175-179	0	100
170-174	0	100
165-169	0	100
160-164	2	60
155-159	1	40
150-154	0	40
145-149	1	20
140-144	0	20
135-139	0	20
130-134	1	0
125-129	0	0
120-124	0	0

SCALE SCORE MEAN: 152.0
STANDARD DEV: 12.7

STUDENTS RESPONDING TO < 50% OF THE ITEMS IN ONE OR BOTH SECTIONS: 0
STUDENTS IN FREQUENCY DISTRIBUTIONS: 5
STUDENTS TESTED: 5

* Based on the percent below the lower limit of the scale score interval

	Student1	Student2	Student3
Total Score	131	139	141
%Below	8	27	30



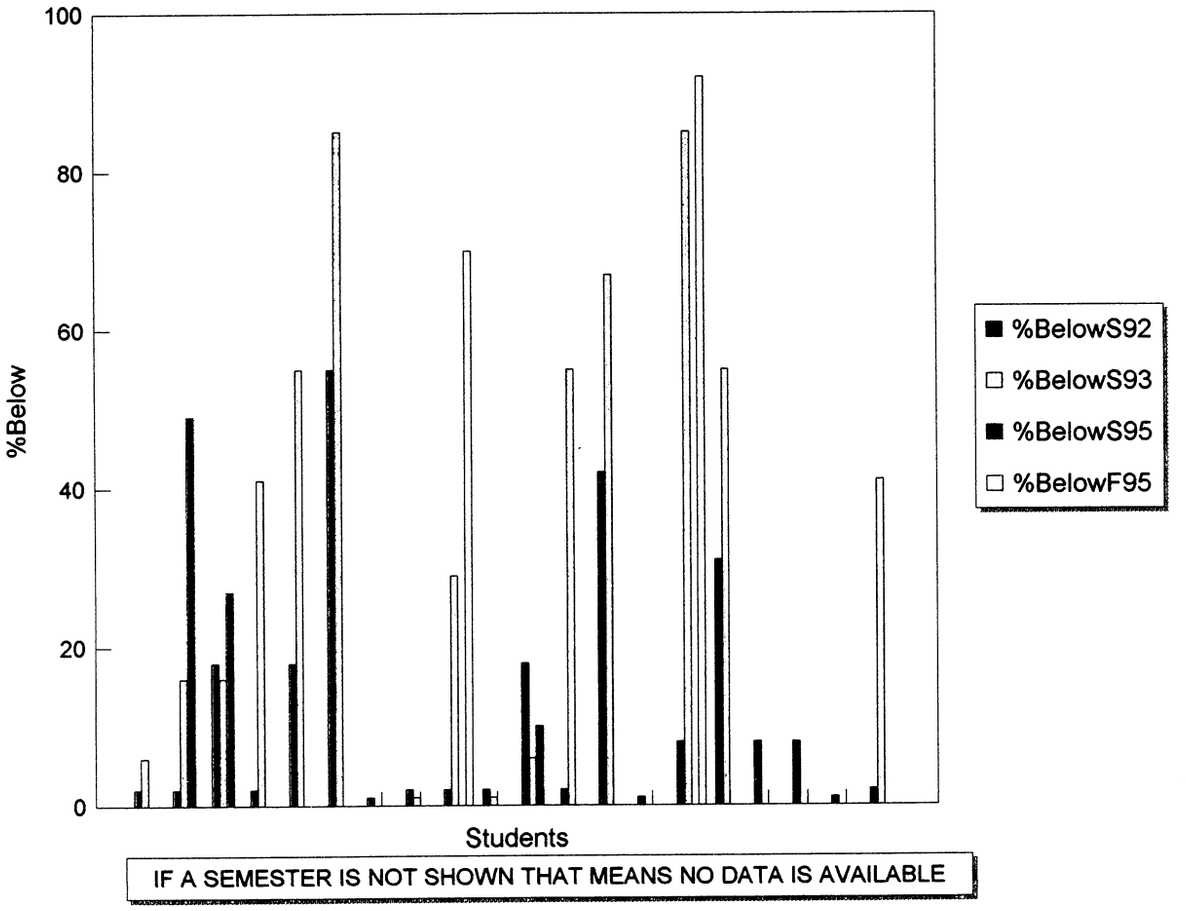
Results of MFAT for 1992-1996, data for F92,F93,S94 and F94 is not available

Student ID	S1992	S1993	S1995	F1995	S1996	F1996
ID428397011	128	130				
ID433130769	126	136	147			
ID433353236	135	139	139			
ID433573774	129	149				
ID435026708	135	150				
ID435172882	151	165				
ID435411972	120					
ID435657376	127	127				
ID437042852	125	144		155		
ID437114433	129	128				
ID437176406	135	132	157			
ID437212530	128	151				
ID437392593	146	155				
ID437456944	123					
ID437499932	130	166		170		
ID438258810	141	152				
ID438494365	133					
ID439139844	130					
ID466115531	120					
ID587301325	125	147				
ID439637945		142		156		
ID435967652		139			157	
ID435571104		168				
ID439391564		127				
ID434473054		124			134	
ID437357004		134	138			
ID439476044			137			
ID437470149				148		
ID439613763					160	
ID436672169					161	
ID439639642					148	
ID425338089						131
ID439199728						139
ID433191218						141

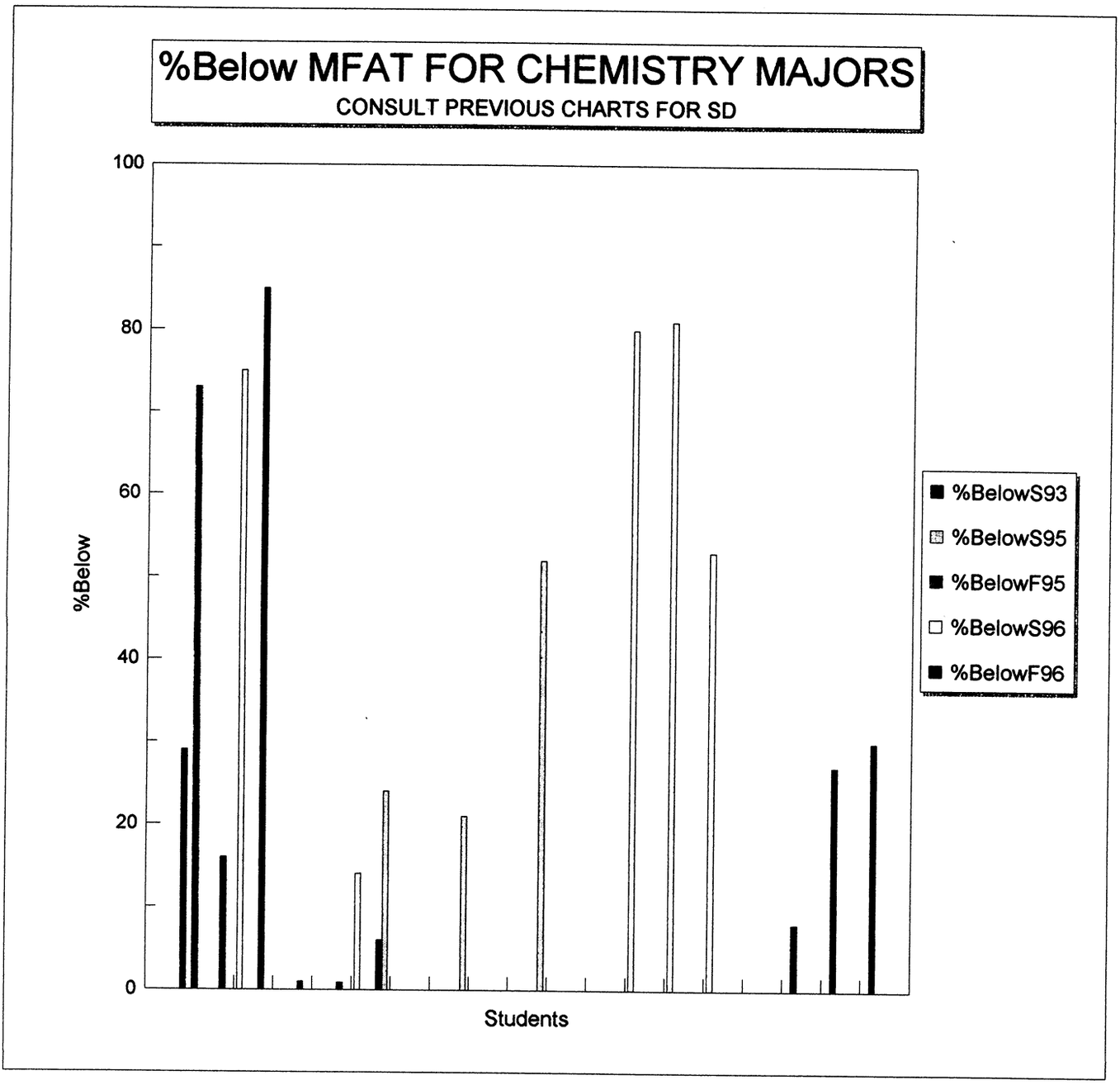
Student ID	%BelowS92	%BelowS93	%BelowS95	%BelowF95	%BelowS96	%BelowF96
ID428397011	2	6				
ID433130769	2	16	49			
ID433353236	18	16	27			
ID433573774	2	41				
ID435026708	18	55				
ID435172882	55	85				
ID435411972	1					
ID435657376	2	1				
ID437042852	2	29		70		
ID437114433	2	1				
ID437176406	18	6	10			
ID437212530	2	55				
ID437392593	42	67				
ID437456944	1					
ID437499932	8	85		92		
ID438258810	31	55				
ID438494365	8					
ID439139844	8					
ID466115531	1					
ID587301325	2	41				
ID439637945		29		73		
ID435967652		16			75	
ID435571104		85				
ID439391564		1				
ID434473054		0.9			14	
ID437357004		6	24			
ID439476044			21			
ID437470149			52			
ID439613763					80	
ID436672169					81	
ID439639642					53	
ID425338089						8
ID439199728						27
ID433191218						30

%BELOW ON MFAT FOR CHEMISTRY MAJORS

DURING THIS PERIOD STUDENTS WERE TAKING THE TEST EVERY YEAR



IF A SEMESTER IS NOT SHOWN THAT MEANS NO DATA IS AVAILABLE


%Below MFAT FOR CHEMISTRY MAJORS
CONSULT PREVIOUS CHARTS FOR SD
100
80
60
40
20
0
%Below
Students
%BelowS93
%BelowS95
%BelowF95
%BelowS96
%BelowF96