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16. Abstract

The first teaching of a course entitled "Advanced Accident Reconstruction for the National Accident Sampling System" was conducted May 21-26, 1979, in Ann Arbor, Michigan by the staff of The University of Michigan Highway Safety Research Institute. This report presents an evaluation of the course which was called for in the overall Course Design, Phase I of this project.

Based on the first teaching of this course, our overall evaluation is that the present course objectives cannot be met in a one-week course for technician-level investigators. The mathematical demands, particularly for the trajectory algorithms, seem beyond student capabilities. In light of this finding, it is our general recommendation that the scope of the course be substantially limited for future sessions.

17. Key Words	18. Distribution Statement
Accident Reconstruction, CRASH2, NASS Training	Unlimited

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TABLE OF CONTENTS

1. INTRODUCTION

Detailed evaluation forms and procedures were developed for each lesson as well as the overall course as part of the Course Design, Phase I, of this project. The first teaching of "Advanced Accident Reconstruction for NASS" was conducted May 21-26, 1979, in Ann Arbor, Michigan, by the staff of The University of Michigan Highway Safety Research Institute. This report presents the results of the various evaluation forms completed by the students, followed by recommendations for modifications to the course.

The objectives of this course as stated in the Contract are:

1. To improve student ability to understand and command the principles, skills, and practices used in reconstruction of the more complicated accident types.
2. To train students to reconstruct precisely and uniformly a wide variety of accident types, based on the practical skills and theories learned in this course.

Existing student knowledge and capabilities were evaluated in developing the overall course design. Our initial determination was that it would be necessary to start from the very basic and elementary principles in the presentation of the course material. It should be kept in mind that the first class was composed of the most able investigator from each team.

Based on the first teaching of this course, it is our overall evaluation that the present course objectives cannot be achieved in a one-week course for technician level investigators. Indeed, even six weeks would be far too little time. In light of this finding, it is our general recommendation that the scope of the course be limited to the "damage-only" computations in the CRASH2 computer program.

Results of the various evaluation forms are found in the following section. A discussion of these results and our recommendations is presented in the last section. In the Appendices are summaries of the entire evaluation form for each lesson plus the overall course evaluation form.

2. RESULTS OF THE EVALUATION FORMS

Immediately following each lesson and at the conclusion of the course, students were asked to provide their reactions and responses to the content and presentation of the lesson/course.

Each student was provided with a lesson evaluation form (Figure 1) at the conclusion of the lesson and asked to anonymously record his immediate reaction to the lesson's subject matter, presentation, and speaker. Also provided was space for written comments. These evaluations were collected and tabulated so as to provide immediate feedback to the instructor(s) and to assist in generating an overall course critique.

The same procedure was followed for the overall course evaluation given following the last lesson. The course evaluation form is shown in Figure 2.

To assist in understanding the order of the presentation of the lessons and their relationship to each other, a list of lessons is shown in Figure 3, and a lesson schedule and calendar is shown in Figure 4. Presented in Appendix A for each lesson's evaluation are: (1) the summary of student responses to the evaluation questions; (2) a summary of the subjective responses, and (3) comments, if any. In Appendix B is a summary of the course evaluation (presented in the same format).

Lesson No. _____

Presentor(s) _____

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 3 4 5
2. Relevant to accident reconstruction	1 2 3 4 5
3. Useful to accident reconstruction	1 2 3 4 5
B. Presentation	
1. Clear	1 2 3 4 5
2. Concise	1 2 3 4 5
3. Organized	1 2 3 4 5
C. Speaker	
1. Qualified	1 2 3 4 5
2. Organized	1 2 3 4 5
3. Interesting	1 2 3 4 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend 1 2 3 4 5 Complete understanding/ comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 2 3 4 5 Yes

Recommendations for improvement:

A. Subject Matter

B. Presentation

C. Speaker

Comments:

FIGURE 1

Advanced Accident Reconstruction for NASS
Lesson Evaluation

To assist us in our review of this course and in planning future course offerings, take a few minutes to evaluate this course.

I. Overall Course

	circle your response				
A. Subject matter	NO				YES
1. Appropriate for this course	1	2	3	4	5
2. Relevant to accident reconstruction	1	2	3	4	5
3. Useful in accident reconstruction	1	2	3	4	5
B. Presentations					
1. Clear	1	2	3	4	5
2. Concise	1	2	3	4	5
3. Organized	1	2	3	4	5
C. Speakers					
1. Qualified	1	2	3	4	5
2. Organized	1	2	3	4	5
3. Interesting	1	2	3	4	5

Circle your level of comprehension/understanding of the material presented in this course.

Did not understand/ comprehend				Complete understanding/ comprehension
1	2	3	4	5

As a result of this course will you be better able to reconstruct accidents?

NO				YES
1	2	3	4	5

D. Did this course live up to your expectations? NO YES

E. Describe your expectations upon arrival at the course.

FIGURE 2

Advanced Accident Reconstruction
Course Evaluation

FIGURE 2 (Continued)

F. How did we (fail, live up to) your expectations?

G. Was the content level of the course too high, too low for your level of expertise?

High or Low

H. If the course was offered again in its present form would other team members benefit from attending?

Yes No

I. Were the pre-course exercises useful?

Yes No

FIGURE 2 (Continued)

II. Specific Lessons

Below are listed the specific lessons in the order presented. Indicate whether they were appropriate for this course and indicate whether the length of time for each lesson was appropriate.

	Lesson	Day	Instructor	Appropriate for Course		Time		
				YES	NO	too long	ok	too short
2	Review Exercises	Mon	McDole					
3	Physics & Dynamics	"	Hess					
9	Data Documentation	"	Cooley					
5	Vehicle Force-Deflection	Tues	Campbell					
4	Vehicle Dynamics	"	Winkler					
10	Reconstruction	"	Hess					
8	Vehicle Exam.	"	Cooley					
8L	Vehicle Exam. Lab	"	Cooley					
10	Reconst. Con't.	Wed	Hess con't					
6	Skid Marks	"	Cooley					
7	Scene Exam	"	Cooley					
7L	Scene Exam. Lab	"	Cooley					
11	Application	Thurs	Hess					
11E	Discussion	"	Campbell					
11L	CRASH Lab	"	Hess, staff					
12	Discussion	Fri	Hess, Campbell					
13	Collision Severity	"	Campbell					
14	Final Exam	"	McDole					

Which of the above lessons would you delete from a future course offering? Circle them.

2 3 9 5 4 10 8 8L 6 7 7L 11

11 11E 11L 12 13 14

What subjects (topics) would you like to see included in a future course offering?

FIGURE 2 (Continued)

III. List below any recommendations you have for changes or improvements you would like to see made in this course.

A. Changes

B. Improvements

C. General Comments

Unit I. Course Overview

1. Course Introduction
2. Review Exercises

Unit II. Basic Principles

3. Physics and Dynamics
4. Vehicle Dynamics
5. Vehicle Force-Deflection Characteristics
6. Skid Marks and Analysis

Unit III. Data Collection and Documentation

7. Scene Inspection
7L. Scene Inspection Laboratory
8. Vehicle Inspection
8L. Vehicle Inspection Laboratory
9. Data Documentation

Unit IV. Reconstruction Techniques

10. Classical Reconstruction
11. Applications of Classical Accident Reconstruction
11E. Classical Reconstruction Exercises
11L. CRASH Laboratory
12. CRASH Laboratory Discussion
13. Collision Severity Measures

Unit V. Summation

14. Final Examination
15. Summary & Closure

FIGURE 3

List of Lessons

FIGURE 4

Advanced Accident Reconstruction
Lesson Schedule

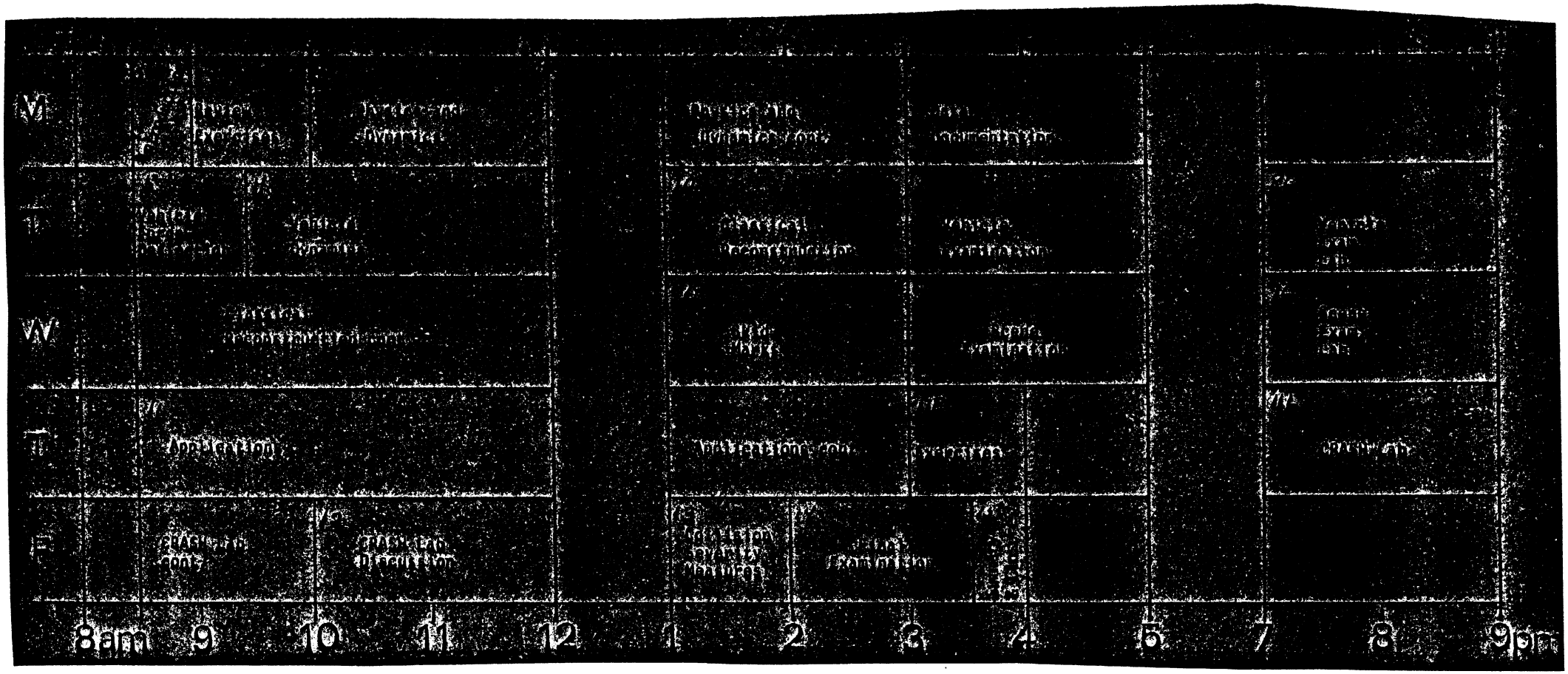

FIGURE 4 (Continued - Daily Calendar)

MONDAY	8:30	1. Introduction	-Campbell & McDole
	9:00	2. Review Exercises	-McDole
	9:45	Break	
	10:00	3. Physics & Dynamics	-Hess
	11:45	Lunch	
	12:45	Lesson 3, cont.	
	2:45	Break	
	3:00	9. Data Presentation	-Cooley
	4:45	End of Day	
TUESDAY	8:30	5. Vehicle Force-Deflection	-Campbell
	9:30	Break	
	9:45	4. Vehicle Dynamics	-Winkler
	11:45	Lunch	
	12:45	10. Classroom Reconstruction	-Hess
	2:45	Break	
	3:00	8. Vehicle Examination	-Cooley
	4:45	Dinner	
	7:00	8L. Vehicle Examination Lab	-Cooley @ HSRI
WEDNESDAY	8:30	Classical Reconstruction, cont.	
	10:00	Break	
	10:15	Classical Reconstruction, cont.	
	11:45	Lunch	
	12:45	6. Skid Marks	-Cooley
	2:45	Break	
	3:00	7. Scene Examination	-Cooley
	4:45	Dinner	
	7:00	7L. Scene Examination Laboratory	-Cooley @ HSRI
THURSDAY	8:30	11. Applications of Classical Accid. Recon.	-Hess
	10:00	Break	
	10:15	Applications, cont.	
	11:45	Lunch	
	12:45	Applications, cont.	
	2:45	Break	
	3:00	11E Exercises	-Hess, Staff
	4:00	Dinner	
	7:00	CRASH Lab.	-Hess @ HSRI

FIGURE 4 (Continued - Daily Calendar)

FRIDAY	8:30		CRASH Lab, cont.	-@ HSRI
	10:00	12.	CRASH Lab Discussion	-@ Chrysler Center
	11:45		Lunch	
	12:45	13.	Collision Severity Measures	
	1:45		Break	
	2:00	14.	Final Examination	
	3:30	15.	Summary & Closure	
	4:00		Dismissal	

In reviewing the large number of summarized evaluation forms contained in the Appendices to this report, it is not difficult to establish the consensus. Apparently the abilities and expectations of the students were fairly uniform. In general, all the lessons dealing with basic algebra, geometry, physics, and the theory of the CRASH2 algorithms are described as "too advanced," "too technical," "too fast*," "too abstract," etc. This response was particularly disheartening to the instructors. A great deal of time and effort went into the development of these materials, the primary objective being to provide a simplified, easily understood, and intuitively appealing presentation of basic principles. These were not college level, theoretical, or abstract discussions. Down-to-earth illustrations and examples pervaded the presentations. However, there is little doubt that nearly all the students were overwhelmed.

By contrast, the lessons on data documentation, scene and vehicle examination, and the related labs were described as "too elementary" and not focused on specific NASS problem areas or applications. It seems that this material, which was specifically called for in the Contract, should be drastically curtailed. The remaining material must focus on specific NASS applications where there are current problems.

*Interpreted to mean pace of presentation was "too fast."

A final exam was also given, and the median score was 70 percent. The range was 56-92 percent. This result underscores the general difficulty students had in grasping the material presented when one takes into account the fact that time did not allow for a comprehensive or rigorous exam.

3. DISCUSSION AND RECOMMENDATIONS

Given the original scope and objectives, we feel that the training course and its associated materials leave little room for improvement with regard to method, level, and teaching technique. (We recognize, of course, some deficiencies in the preparation and production of the course materials.) It is also quite clear that most students were unable to assimilate the mathematical material. Therefore, our first conclusion is that the original course objectives and scope are not realistic in light of the current NASS field operations and personnel. We recommend that the course scope and objectives be re-evaluated and that substantial revisions be made before a second teaching is attempted.

The critical problem is the level of mathematics required to understand the CRASH2 algorithm. In its current configuration, the CRASH2 program is by no means foolproof. It is best described as a research tool which can only be used reliably by someone completely conversant in the theory and operation of its algorithms. As originally configured, the program was internally validated through the comparison of the parallel "damage" and "trajectory" paths. We find that in the current NASS application, the trajectory mode is used less than 5% of the time! This means that the validity rests solely in the hands of the user. This is why it is so important that the user be throughly familiar with the algorithms.

Nearly all of the difficult mathematical material arises from the trajectory algorithm. Almost none of the students have a background to absorb this material even if the course were expanded to six weeks. Furthermore, the students have little motivation to study this material since they seldom have the necessary scene data. The current objectives dictate that the majority of the course focus on the portions of the program

that are used the least! This cannot be avoided so long as the training requirements include the use of the trajectory algorithm.

One resolution is to simplify the CRASH2 program by eliminating all portions of the trajectory algorithm for the NASS application. The mathematical requirements of the damage algorithm would seem to be within the ability of current NASS investigators. The alternative is to significantly upgrade the educational requirements of the NASS accident reconstructionist. This approach does not seem consistent with NASS objectives since the role of subjective judgement on the part of the investigator is likely to expand.

Even after narrowing the scope to the damage algorithm, a parallel recommendation is to allow a single team member to "specialize" in accident reconstruction and to allow a lesser understanding on the part of the other investigators. Accident reconstruction is a specific skill requiring knowledge in the physical sciences. The task of accident reconstruction requires the assimilation of facts concerning the accident scene and vehicles and applying mathematical models to the data to arrive at a "reconstruction of the facts." It would seem unrealistic to expect all team members to be fully grounded in this area.

With a narrowed scope it would be possible to expand the pre-course material and teaching time on the necessary fundamentals. Time would also be available for pre-worked exercises focusing on typical NASS applications. All data collection material should be eliminated with exception of specific topics which address current problems or new procedures. In summary, it is our evaluation that substantial modifications to the course are needed.

APPENDICES

APPENDIX A

INDIVIDUAL LESSON EVALUATIONS

NOTE: Lessons Number 1--Introduction and 2--Review Exercises were not evaluated separately.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 3

Presentor(s) Hess - Summary 15 responses

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 (3) 4 5
2. Relevant to accident reconstruction	1 2 (3 4) 5
3. Useful to accident reconstruction	1 2 (3 4) 5
B. Presentation	
1. Clear	1 (2 3) 4 5
2. Concise	1 2 (3 4) 5
3. Organized	1 2 (3 4) 5
C. Speaker	
1. Qualified	1 2 3 4 (5)
2. Organized	1 2 3 (4) 5
3. Interesting	1 2 3 (4) 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend 1 2 (3) 4 5 Complete understanding/ comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 (2) 3 4 5 Yes

Recommendations for improvement:

A. Subject Matter

B. Presentation } Attached

C. Speaker

Comments:

A. Subject Matter - Too abstract and advanced; insufficient preparation prior to class; more definitions and applications needed.

B. Presentation - Too fast, too technical; relate material to actual accident reconstruction. Audio-visual aids need improvement (leave materials on screen longer).

C. Speaker - Qualified, good instructor; analogies were helpful.

Comments: Overall, information was very useful but difficult to understand and apply.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 4

Presentor(s) Wachter 13 responses

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 3 4 5
2. Relevant to accident reconstruction	1 2 3 4 5
3. Useful to accident reconstruction	1 2 3 4 5
B. Presentation	
1. Clear	1 2 3 4 5
2. Concise	1 2 3 4 5
3. Organized	1 2 3 4 5
C. Speaker	
1. Qualified	1 2 3 4 5
2. Organized	1 2 3 4 5
3. Interesting	1 2 3 4 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend 1 2 3 4 5 Complete understanding/ comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 2 3 4 5 Yes

Recommendations for improvement:

A. Subject Matter

B. Presentation } Handout

C. Speaker

Comments:

A. Subject Matter - Definitions needed; pre-class references would help. Too much theory without practical application.

B. Presentation - Too much material, too advanced - wrong assumptions made about students' capabilities.

C. Speaker - Did a good job, but needs to speak up.

Comments - None.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 5

Presentor(s) Campbell 13 responses

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 3 4 (5)
2. Relevant to accident reconstruction	1 2 3 4 (5)
3. Useful to accident reconstruction	1 2 3 (4) 5
B. Presentation	
1. Clear	1 2 3 4 (5)
2. Concise	1 2 3 4 (5)
3. Organized	1 2 3 4 (5)
C. Speaker	
1. Qualified	1 2 3 4 (5)
2. Organized	1 2 3 4 (5)
3. Interesting	1 2 3 (4) 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend 1 2 3 (4) 5 Complete understanding/ comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 2 3 (4) 5 Yes

Recommendations for improvement:

A. Subject Matter

B. Presentation } Adequate

C. Speaker

Comments:

A. Subject Matter - very good; sample problems would be helpful.

B. Presentation - No improvement needed, copies could be better.

C. Speaker - very good.

Comments - Overall, excellent presentation. Few saw any room for improvement.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 6

Presentor(s) Cooley - Summary 15 responses

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 3 4 (5)
2. Relevant to accident reconstruction	1 2 3 4 (5)
3. Useful to accident reconstruction	1 2 3 4 (5)
B. Presentation	
1. Clear	1 2 3 (4) (5)
2. Concise	1 2 3 (4) (5)
3. Organized	1 2 3 (4) 5
C. Speaker	
1. Qualified	1 2 3 4 (5)
2. Organized	1 2 3 (4) (5)
3. Interesting	1 2 3 (4) 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend				Complete understanding/ comprehension
1	2	3	4	(5)

As a result of this lesson will you be better able to reconstruct accidents?

No			Yes
1	2	3 (4)	5

Recommendations for improvement:

A. Subject Matter

B. Presentation } Attached

C. Speaker

Comments:

A. Subject Matter - Good; relevant to course; interesting.

B. Presentation - More audio-visual aids would be good. Definitions would help. Relate to crash to a greater extent.

C. Speaker - None.

Comments - Overall, very good. Few improvements suggested.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 7

Presentor(s) Cooley 15 reconstructions

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 3 4 (5)
2. Relevant to accident reconstruction	1 2 3 4 (5)
3. Useful to accident reconstruction	1 2 3 4 (5)
B. Presentation	
1. Clear	1 2 3 (4) 5
2. Concise	1 2 3 (4) 5
3. Organized	1 2 3 (4) 5
C. Speaker	
1. Qualified	1 2 3 4 (5)
2. Organized	1 2 3 (4) 5
3. Interesting	1 2 3 (4) 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/comprehend 1 2 3 4 (5) Complete understanding/comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 2 (3 4) Yes 5

Recommendations for improvement:

A. Subject Matter

B. Presentation } attached

C. Speaker

Comments:

A. None.

B. None.

C. None.

Comments: Few subjective comments. Examples worked in class would have been helpful.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 7L

Presentor(s) Cooley / McDole 12 reviewers

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 3 4 (5)
2. Relevant to accident reconstruction	1 2 3 4 (5)
3. Useful to accident reconstruction	1 2 3 (4) (5)
B. Presentation	
1. Clear	1 2 3 (4) 5
2. Concise	1 2 (3) (4) 5
3. Organized	1 (2) (3) 4 5
C. Speaker	
1. Qualified	1 2 3 (4) 5
2. Organized	1 2 3 (4) 5
3. Interesting	1 2 (3) (4) 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend 1 2 3 4 (5) Complete understanding/ comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 (2) 3 4 5 Yes

Recommendations for improvement:

A. Subject Matter

B. Presentation

C. Speaker

Comments:

A. None

B. None

C. None

Comments - In need of better organization; subject matter too general and basic; more complex situations--skid patterns, scrapes, gouges, etc. would have provided more informative instruction. Actual sample investigation would have been helpful; taking a whole evening session for this lesson seemed unjustified.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 8

Presentor(s) Cooley & Isaksen

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 3 (4) 5
2. Relevant to accident reconstruction	1 2 3 (4 5)
3. Useful to accident reconstruction	1 2 3 (4 5)
B. Presentation	
1. Clear	1 2 3 (4) 5
2. Concise	1 2 (3 4) 5
3. Organized	1 2 (3 4) 5
C. Speaker	
1. Qualified	1 2 3 4 (5)
2. Organized	1 2 3 (4) 5
3. Interesting	1 2 3 (4) 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend 1 2 3 4 (5) Complete understanding/ comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 2 3 (4) 5 Yes

Recommendations for improvement:

A. Subject Matter

B. Presentation } attached

C. Speaker

Comments:

A. Subject Matter - too basic; more specific areas should have been addressed, e.g., roll-overs, non-horizontal impacts, sideswipes, etc. Reference material for study prior to class would be helpful.

B. None

C. None

Comments - overall favorable responses; few suggestions for improvement.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 8L

Presentor(s) Cooley 14 responses

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 3 4 (5)
2. Relevant to accident reconstruction	1 2 3 4 (5)
3. Useful to accident reconstruction	1 2 3 4 (5)
B. Presentation	
1. Clear	1 2 (3 4 5)
2. Concise	1 2 (3) 4 5
3. Organized	1 2 (3) 4 5
C. Speaker	
1. Qualified	1 2 (3 4 5)
2. Organized	1 2 (3 4) 5
3. Interesting	1 2 (3 4) 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend 1 2 3 4 (5) Complete understanding/ comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 (2 3 4) Yes 5

Recommendations for improvement:

A. Subject Matter
B. Presentation
C. Speaker

attached

Comments:

A. Subject Material - Nothing new; more in-depth application to Crash needed.

B. Presentation - Needed organization.

C. Speaker - good.

Comments - Overall, few suggestions for improvement.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 9

Presentor(s) P Cooley

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

		circle your response NO Yes
A.	Subject matter	
	1. Appropriate for this course	1 2 3 4 5
	2. Relevant to accident reconstruction	1 2 3 4 5
	3. Useful to accident reconstruction	1 2 3 4 5
B.	Presentation	
	1. Clear	1 2 3 4 5
	2. Concise	1 2 3 4 5
	3. Organized	1 2 3 4 5
C.	Speaker	
	1. Qualified	1 2 3 4 5
	2. Organized	1 2 3 4 5
	3. Interesting	1 2 3 4 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend 1 2 3 4 5 Complete understanding/ comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 2 3 4 5 Yes

Recommendations for improvement:

A. Subject Matter

B. Presentation } all good

C. Speaker

Comments:

A. Subject Matter - Relate more to NASS; otherwise interesting.

B. None.

C. None.

Comments - Few suggestions for improvement; speaker was impressive and informed.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 10

Presentor(s) Hess 15 reviewers

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 3 (4) 5
2. Relevant to accident reconstruction	1 2 3 (4) 5
3. Useful to accident reconstruction	1 2 3 (4) 5
B. Presentation	
1. Clear	1 2 3 (4) 5
2. Concise	1 2 3 (4) 5
3. Organized	1 2 3 (4) 5
C. Speaker	
1. Qualified	1 2 3 4 (5)
2. Organized	1 2 3 (4) 5
3. Interesting	1 2 3 4 (5)

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend 1 2 3 (4) 5 Complete understanding/ comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 2 (3 4) 5 Yes

Recommendations for improvement:

A. Subject Matter

B. Presentation

C. Speaker

Comments:

A. Subject Matter - Too advanced and hard to understand. Little relevance to accident investigation.

B. Presentation - Too much material in too little time.

C. None.

Comments - None.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 10 continued

Presentor(s) Herr 16 responses

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 3 4 (5)
2. Relevant to accident reconstruction	1 2 3 4 (5)
3. Useful to accident reconstruction	1 2 3 4 (5)
B. Presentation	
1. Clear	1 2 3 (4) 5
2. Concise	1 2 3 (4) 5
3. Organized	1 2 3 (4) 5
C. Speaker	
1. Qualified	1 2 3 4 (5)
2. Organized	1 2 3 (4 5)
3. Interesting	1 2 3 (4 5)

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend — Complete understanding/ comprehension

1 2 (3 4) 5

As a result of this lesson will you be better able to reconstruct accidents?

No — Yes

1 2 (3 4 5)

Recommendations for improvement:

A. Subject Matter

B. Presentation } attached

C. Speaker

Comments:

A. Subject Matter - Too advanced, but beginning to make more sense (for some).

B. Presentation - Lacked organization; too much material covered.

C. Speaker - Well-informed.

Comments - None.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 11

Presentor(s) Heer n = 13

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 3 4 (5)
2. Relevant to accident reconstruction	1 2 3 4 (5)
3. Useful to accident reconstruction	1 2 3 4 (5)
B. Presentation	
1. Clear	1 2 3 (4) 5
2. Concise	1 2 3 (4) 5
3. Organized	1 2 3 (4) 5
C. Speaker	
1. Qualified	1 2 3 4 (5)
2. Organized	1 2 3 (4) 5
3. Interesting	1 2 3 (4) 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend 1 2 3 (4) 5 Complete understanding/ comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 2 (3) 4 5 Yes

Recommendations for improvement:

A. Subject Matter

B. Presentation } attached

C. Speaker

Comments:

A. Subject Matter - Too much theory; hard to understand. Prior preparation needed.

B. Presentation - Too Much Material.

C. None.

Comments - None.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 11E

Presentor(s) Campbell 13 responses

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 3 4 (5)
2. Relevant to accident reconstruction	1 2 3 4 (5)
3. Useful to accident reconstruction	1 2 3 4 (5)
B. Presentation	
1. Clear	1 2 3 (4 5)
2. Concise	1 2 3 (4 5)
3. Organized	1 2 (3 4) 5
C. Speaker	
1. Qualified	1 2 3 4 (5)
2. Organized	1 2 3 (4) 5
3. Interesting	1 2 3 (4) 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend 1 2 3 (4) 5 Complete understanding/ comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 2 3 (4) 5 Yes

Recommendations for improvement:

A. Subject Matter

B. Presentation } all good!

C. Speaker

Comments:

A. Subject Matter - need more examples.

B. Speaker - Very good; clear and easy to understand.

C. None.

Comments - None.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 11 L

Presentor(s) CRASH - ab 13 responses

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

		circle your response				
		NO				Yes
A.	Subject matter					
1.	Appropriate for this course	1	2	3	4	(5)
2.	Relevant to accident reconstruction	1	2	3	4	(5)
3.	Useful to accident reconstruction	1	2	3	4	(5)
B.	Presentation					
1.	Clear	1	2	3	(4)	5
2.	Concise	1	2	(3)	(4)	5
3.	Organized	1	2	(3)	(4)	5
C.	Speaker	Not Applicable				
1.	Qualified	(0)	1	2	3	4 5
2.	Organized	(0)	1	2	3	4 5
3.	Interesting	(0)	1	2	3	4 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend				Complete understanding/ comprehension
1	2	3	(4)	(5)

As a result of this lesson will you be better able to reconstruct accidents?

No				Yes
1	2	3	(4)	5

Recommendations for improvement:

A. Subject Matter

B. Presentation } attached

C. Speaker

Comments:

A. Subject Matter - Real-life examples would be helpful; prior preparation needed.

B. Presentation - lacked organization, more structure needed.

C. None.

Comments - None.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 12

Presentor(s) Campbell / Hart Responses

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 3 (4) 5
2. Relevant to accident reconstruction	1 2 3 (4) 5
3. Useful to accident reconstruction	1 2 3 (4) 5
B. Presentation	
1. Clear	1 2 (3) 4 5
2. Concise	1 2 (3) 4 5
3. Organized	1 (2 3) 4 5
C. Speaker	
1. Qualified	1 2 3 4 (5)
2. Organized	1 2 (3 4) 5
3. Interesting	1 2 (3) 4 5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend 1 2 (3) 4 5 Complete understanding/ comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 2 (3) 4 5 Yes

Recommendations for improvement:

A. Subject Matter

B. Presentation } none

C. Speaker

Comments:

A. Subject Matter - little relevance to NASS.

B. Few suggestions for improvement.

C. None.

Comments - None.

Advanced Accident Reconstruction for NASS
Lesson Evaluation

Lesson No. 13

Presentor(s) Campbell

Please evaluate the Subject matter, Presentation, and Speaker as they relate to this lesson by responding to the following items.

	circle your response NO Yes
A. Subject matter	
1. Appropriate for this course	1 2 (3 4) 5
2. Relevant to accident reconstruction	1 2 (3 4) 5
3. Useful to accident reconstruction	1 2 (3 4) 5
B. Presentation	
1. Clear	1 2 3 (4 5)
2. Concise	1 2 3 (4 5)
3. Organized	1 2 3 (4 5)
C. Speaker	
1. Qualified	1 2 3 4 (5)
2. Organized	1 2 3 (4 5)
3. Interesting	1 2 3 4 (5)

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend 1 2 3 4 (5) Complete understanding/ comprehension

As a result of this lesson will you be better able to reconstruct accidents?

No 1 (2) 3 4 5 Yes

Recommendations for improvement:

A. Subject Matter

B. Presentation

C. Speaker

attached

Comments:

A. Subject Matter - Tended to clarify reasons behind accident investigation and research.

B. None.

C. None.

Comments - Few comments.

APPENDIX B

COURSE EVALUATION

Advanced Accident Reconstruction

Course Evaluation

To assist us in our review of this course and in planning future course offerings, take a few minutes to evaluate this course.

I. Overall Course

	circle your response NO				YES
A. Subject matter					
1. Appropriate for this course	1	2	3	(4)	5
2. Relevant to accident reconstruction	1	2	(3)	4	5
3. Useful in accident reconstruction	1	2	3	4	5
B. Presentations					
1. Clear	1	2	(3)	4	5
2. Concise	1	2	3	4	5
3. Organized	1	2	3	4	5
C. Speakers					
1. Qualified	1	2	3	4	(5)
2. Organized	1	2	3	(4)	5
3. Interesting	1	2	(3)	4	5

Circle your level of comprehension/understanding of the material presented in this lesson.

Did not understand/ comprehend				Complete understanding/ comprehension
1	2	(3)	4	5

As a result of this course will you be better able to reconstruct accidents?

NO				YES
1	2	(3)	4	5

D. Did this course live up to your expectations? (NO) YES

E. Describe your expectations upon arrival at the course.

Attached

F. How did we (fail, live-up-to) your expectations?

Attached

G. Was the content level of the course too high, too low for your level of expertise?

(High) or Low

Attached

H. If the course was offered again in its present form would other team members benefit from attending?

Yes (No)

Attached

I. Were the pre-course exercises useful?

(Yes) No

Attached

II. Specific Lessons

Below are listed the specific lessons in the order presented. Indicate whether they were appropriate for this course and indicate whether the length of time for each lesson was approparite.

	Lesson	Day	Instructor	Appropriate for Course		Time		
				YES	NO	too long	ok	too short
2	Review Exercises	Mon	McDole	✓			✓	
3	Physics & Dynamics	"	Hess	✓		✓		
9	Data Documentation	"	Cooley	✓			✓	
5	Vehicle Force-Deflection	Tues	Campbell	✓			✓	
4	Vehicle Dynamics	"	Winkler	✓			✓	✓
10	Reconstruction	"	Hess	✓		✓		
8	Vehicle Exam.	"	Cooley	✓			✓	
8L	Vehicle Exam. Lab	"	Cooley	✓				✓
10	Reconst. Con't.	Wed	Hess con't	✓		✓	✓	✓
6	Skid Marks	"	Cooley	✓			✓	
7	Scene Exam	"	Cooley	✓			✓	
7L	Scene Exam. Lab	"	Cooley	✓		—	—	—
11	Application	Thurs	Hess	✓			✓	✓
11E	Discussion	"	Campbell	✓			✓	
11L	CRASH Lab	"	Hess, staff	✓			✓	
12	Discussion	Fri	Hess, Campbell	✓			✓	
13	Collision Severity	"	Campbell	✓			✓	
14	Final Exam	"	McDole	✓			✓	

Which of the above lessons would you delete from a future course offering? Circle them.

2 3 9 5 4 10 8 (8L) 6 7 (7L) 11

11 11E 11L 12 13 14

Key

What subjects (topics) would you like to see included in a future course offering?

attach

III. List below any recommendations you have for changes or improvements you would like to see made in this course.

A. Changes?

attached

B. Improvements

attached

C. General Comments

attached

I. Pre-course exercises generally seen as very helpful, though not extensive or elaborate enough. More reference material or study resources suggested.

II. Topics, subjects that should be included in future courses: More CRASH application with specific, realistic field data; more practical and specific field investigation instruction (e.g., skids, scrapes, etc.).

III. A. Should be a longer course; too much material in too short a time period. Instructors should have a better understanding of students' abilities and simplify lecture material accordingly. More pre-course reference and study material and better overall organization of lectures and handouts suggested.

B. Improvements:
More field work.
Less technical discussion.

C. General. Program considered useful despite the high level of understanding it required. Instructors well received; seen as well-prepared, competent and professional. Overall, students seemed positive, though a bit overwhelmed.

Subjective Responses - Course Evaluation

I. E. Expectations.

Many expected basic ("elementary") instruction on a "practical level"; abstractions and theory not anticipated. Specific training covering the finer points in accident investigation and reconstruction was expected, as opposed to simply being taught how the computer works. A few were expecting more precise analytical training. Many wanted instruction that dealt with CRASH in relation to field investigation.

F. Students generally found the explanation of CRASH informative, but wanted material more specifically related to investigation.

Instructor's expectations of math and technical understanding too high.

G. Subject matter was too advanced in the areas of physics, dynamics, math and CRASH programming. On the other hand, course content dealing specifically with accident investigation was too low for most students.

H. Most NASS team members would not benefit from the course in its present form because of the high level of understanding in math, physics, etc. expected. Only 3 students said that it would be beneficial; these responses were qualified, however.