NOTICE

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EDUCATION DATA BASE
SEMIANNUAL REPORT

OCTOBER 1, 1978 - MARCH 31, 1979

KEVIN O'CONNOR

JULY 1979

PREPARED UNDER TASK NO. 4231

Solar Energy Research Institute
1536 Cole Boulevard
Golden, Colorado 80401

A Division of Midwest Research Institute

Prepared for the
U.S. Department of Energy
Contract No. EG·77·C·01·4042
This progress report was performed in compliance with DOE Contract Number EG-77-C-01-4042. This report represents the six-month effort of progress in the Education Data Base, Task 4231 in the Academic Programs Branch. In addition to myself, George Corcoleotes provided a major contribution to the performance of this task. The Data Base Systems Branch, especially Katherine Kramer, provided the main effort as liaison in the technical work of getting the information from coded forms to a searchable data base.

Kevin O'Connor
Academic Programs Branch

Approved for SERI:

George Warfield, Assistant Director
Academic and International Programs
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SECTION 1.0
INTRODUCTION

1.1 SCOPE

The Solar Energy Education Data Base (SEEDB) task was established as a high priority in the Academic Programs Branch to serve as an information dissemination tool and to identify the active people and organizations in the educational arena.

SERI's Information Systems Division is responsible for the development of the Solar Energy Information Data Bank (SEIDB), a national repository of solar information. The education data base is part of the SEIDB. Justification of the SEIDB stems from the fact that no centralized collection effort exists for educational institutions offering solar energy courses, programs, and curricula.

Work on this project began in April 1978. From April through September 1978 (FY78), several major tasks were accomplished. A data collection effort was coordinated with the cooperation of the Office of U.S. Congressman George E. Brown, Jr. and SERI. The education data base file definitions and structures were defined for building the data base at Stanford University using the SPIRES software system. Finally, a large effort was devoted to editing, coding, and verifying the data from the survey instruments. The original survey package utilized is found in Appendix A.

1.2 PURPOSE

The SEEDB was established to respond to the needs of a full range of users: academicians, industry, government agencies, research organizations, students, private individuals, etc. The data base will be updated periodically, it will contain information which is accessible to the public in a variety of published materials and will have the flexibility to be able to respond quickly to special requests.

The SEEDB is designed to facilitate information flow to the user community on technological developments in solar energy. In this manner, the education community can plan new programs which can be targeted to supplying projected manpower skills for emerging solar technologies.
SECTION 2.0

SUMMARY OF PROGRESS AND ACHIEVEMENTS

2.1 DATA BASE ESTABLISHMENT

The development of a computerized data base is a complex process of coordination among many people, and involves constant attention to minute details. Some of the events and tasks are itemized below:

- **Forms Development and Revision.** Included reaching consensus of all involved parties: Congressman Brown's Office; Academic Programs; Data Base Systems; and Computer Service Branches.

- **Survey and Forms Printing.**

- **Survey Distribution.** Generating mailing labels, stuffing, and mailing operation.

- **Survey Preparation for Data Entry.** Editing, coding, and solving survey return problems.

- **Data Element and File Definitions.** This task is needed for data base to be entered and retrieved intelligently.

- **Initial System Creation.** Two modes were employed here. Creation of data base was initially made using the Office of Education's National Center of Education Statistics file for selecting building institution name, address, and attribute information. The second mode was to test system's ability to build full records from survey returns and verify that data were stored appropriately and retrievable as expected.

- **Final System Checkout.** Used several hundred schools for verification of system.

- **Report Definition.** Publications to be created from system, especially National Solar Energy Education Directory (to be computer generated), needed to be precisely defined.

- **Create System Flow Charts.** Figure 2-1 shows the General System Operational Flowchart and Conceptual System Reporting procedures.

- **Design of Update Mechanisms.** Will occur in second half of FY79 when system changeover occurs. Other procedures for inputting changes, and for adding and deleting institutional data were defined.

The Task/Milestone Chart for the SEEDB is found in Fig. 2-2. Basically, all tasks were accomplished on schedule during the time period of the report.
Figure 2-1. SOLAR ENERGY EDUCATION DATA BASE: GENERAL SYSTEM OPERATIONAL FLOWCHART
<table>
<thead>
<tr>
<th>TASK/EVENT</th>
<th>FY78</th>
<th>FY79</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
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<td></td>
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<td>3. System Flowcharts</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
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<td>5. Coding Manuals/Tables</td>
<td></td>
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</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>7. Initial System Creation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Design Update Mechanisms</td>
<td></td>
<td></td>
</tr>
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<td>9. Final System Checkout</td>
<td></td>
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</tr>
<tr>
<td>10. System Implementation - Creation Tasks Completed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Print Education Directory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Run Special Reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. First Annual Update</td>
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</tr>
</tbody>
</table>

**Symbol Meaning**

- △ Milestone Beginning
- ○ Intermediate Task/Report Complete
- □ Milestone Complete

**Footnotes**

1 - Preliminary Flowchart Complete
2 - Coding Schemes Gathered, Reviewed
3 - Initial System Creation - Small Sample
4 - Special Reports Produced
2.2 SUMMARY OF ACHIEVEMENTS

October 1978
- Education Data Base created from Office of Education tape. Initial data entry of coded, verified surveys begun.
- 2,200 Surveys received from 3,200 educational institutions.

November 1978
- All initial response data entered and verified.

December 1978
- Initiated new survey update for 2nd iteration of data base update.

January 1979
- Education Data Base demonstrated at National Energy Education, Business, and Labor Conference in Washington, D.C.

February 1979
- Received 1,175 copies of NSEEED. Cover wording questions were noted. Report was returned to printer for recovering.
- Initial draft of state solar energy education directories is prepared.
- Many more iterations of survey update form occur. Staff review and Survey Review Committee interactions take place. This is a complex, time-consuming procedure.

March 1979
- Camera-ready copies of state solar energy education directories sent to printers.
- Survey Update Form - Finalized and sent to printer. See Appendix B for new survey package.
- Rough draft of Solar Energy Technical Training Directory prepared.
SECTION 3.0
SIGNIFICANT UPCOMING ACTIVITIES

3.1 NEAR TERM - FY79 (APRIL - SEPTEMBER)

- Print and distribute individual State Solar Energy Education Directories (SSEED). Distribution of SSEEDs will be handled by the Dissemination Systems Group in Information Systems.
- Print and advertise National Solar Energy Technical Training Directory.
- Produce a summary report of the Solar Energy Education Data Base.
- Conduct Education Data Base update in cooperation with Congressman Brown's Office.
- Switch over Data Base from SPIRES to INQUIRE. Enter all new data.

3.2 FY80 ACTIVITIES

- Print updated State Solar Energy Education Directories.
- Print updated Technical Training Directory.
- Expand data base to include non-educational and international institution information.
- Produce data base summary and other special reports as necessary.
- As part of the education data base task, produce a directory of research activities in the nation's colleges and universities using the Smithsonian Science Information Exchange Service.
APPENDIX A

FIRST NATIONAL SOLAR ENERGY EDUCATION SURVEY PACKAGE

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FIRST NATIONAL SOLAR ENERGY EDUCATION SURVEY

July, 1978

TO: Presidents of Educational Institutions, Institute Heads, Deans and Department Directors offering Educational Programs in Solar Energy


The Congressional Solar Coalition is interested in your participation in a cooperative effort to create a data base of all solar energy-related programs and courses currently being offered by our nation’s post-secondary educational institutions.

Two organizations have agreed to work with the collected information. The Solar Energy Research Institute (SERD in Golden, Colorado will have responsibility for the creation of a computerized data base which will become part of the legislatively mandated Solar Energy Information Data Bank (SEIDB). SERI's Information Systems Branch will receive the survey returns, edit and process the data into a computerized data base, and create the appropriate retrieval, reporting, updating, and analysis mechanisms. The compilation of collected material will be made available in a published Solar Energy Educational Directory. As an interim measure, before the computerized data base at SERI is fully operational, the National Solar Heating and Cooling Information Center (NSHIC) will have the capability of providing a listing of solar educational offerings on a state-by-state basis free of charge to anyone by calling their toll-free number: (800) 523-2929.

The suggested deadline for returning the survey is September 15, 1978. For the purpose of this survey, wind, biomass conversion, and ocean thermal energy conversion should also be considered as solar technologies. New courses, curricula, and updates will be accepted any time following the September 15th date. However, this is not preferred. Even if you do not offer solar courses, please complete and return the first page of the form.

We appreciate your participation and, for your help, the Solar Energy Research Institute will be sending you a listing of the programs in your state. We hope you will be able to use the compiled information for your own course and/or curriculum development.

We would also like to use this opportunity to make sure that you are aware of the Higher Education Act Amendments of 1976. Of particular importance is an amendment introduced by Sen. Thomas J. McIntyre, (N.H.), that allows Federal Funds to be used for solar education programs in post-secondary vocational education schools. You might want to investigate your own possible uses of federal funds for the development of new or additional solar energy curricula.
Solar Energy Educational Survey Instructions

If your institution is not offering any solar related programs, please complete only the first page of the survey, so indicating. If solar offerings are made by your institution, we would be happy to receive any additional information which you feel would be helpful.

The three-page survey form is designed to elicit information on solar-related programs, courses, and/or curricula currently being offered or planned to be offered by educational institutions. Your assistance in making the form entries as complete as possible will be greatly appreciated. There are two sections to be completed: (1) Educational Institutions and (2) Course Information (2 pages). Some detailed instructions may help in answering certain questions. Note that for the purpose of this survey wind, biomass conversion, and ocean thermal energy conversion should also be considered as solar technologies.

I. Educational Institutions

Q. 4. If your institution offers or plans to offer a solar curriculum or program, answer "yes" to question 4 and complete questions 5 through 12 for each curriculum or program offered or planned. Duplicate the form if necessary.

Q. 5-12. In questions 5 through 12, information relative to solar curricula and programs is requested, as distinguished from single course offerings. A curriculum is a set of integrated courses leading toward a degree or certificate. A program is loosely defined as a formal academic experience usually combining course-work and research in applied solar technology, but not necessarily leading to a degree in solar expertise. Specialized summer programs and research institutes are examples. The answer to Q. 8, Head of Prog./Curr., should be the main contact person for someone desiring more information about the program or curriculum. Question 12 estimates the proportion of students successfully placed in solar-related jobs.

Q. 13-14. Please answer question 14, regardless of the answer given in question 13. If your institution is presently offering solar courses ("Yes" to question 13), it may also be developing additional courses.

II. Course Information

Please complete the Course Information Section (2 pages) for each separate, solar-related course, either presently offered or planned to be offered. Duplicate the Course Information Section if necessary to cover all solar courses offered. Any questions you may have concerning the survey form may be answered by Kevin O'Connor at SERI: (303) 234-7235.

Using the envelope provided, please return all completed surveys by September 15, 1978. A further update or correction may be returned at any time to:

Solar Energy Research Institute
Attn: Educational Data Base
1536 Cole Boulevard
Golden, Colorado 80401

Thank you very much for your participation.
I. Educational Data Base — Educational Institutions

1. Institution Name: ____________________________________________________________

2. Address: _________________________________________________________________
   Street __________________________ City __________________________ State _______
   Zip __________________________

3. Institution Type:
   □ 4 Yr. Coll./Univ./Grad. School
   □ Community/ Junior College
   □ Vocational/Technical School
   □ Other (describe) _______________________________________________________

4. Does your institution offer/plan a Solar Curriculum or Program?      Yes □ No □
   If "No", go to Question 13.

Please complete Questions 5-12 for each solar energy Curriculum or Program offered or planned. If more than one Program/Curriculum is offered/planned please make copies of this section and attach.

5. Is the offering a Program?  □ Yes □ No  or Curriculum?  □ Yes □ No
   Currently Offered?  □ Yes □ No or Planned?  □ Yes □ No

6. Program/Curriculum Name: _______________________________________________

7. College/Dept. offering Program/Curriculum: _________________________________

8. Head of Prog./Curr.: ____________________________________________ Phone: (____)_______

9. What Degree/Title/Certificate, if any, does graduating student receive?
   □ Ph.D. □ MA □ MS □ BA □ BS □ Associate Degree □ None
   □ Other (specify) _______________________________________________________

10. Name of Degree/Title/Certificate: _______________________________________

11. Students completing Program/Curriculum would generally be classified as (check as many as apply):
   □ Architect
   □ Educator
   □ Researcher
   □ Solar Engineer
   □ Solar System Installer:
     □ Residential
     □ Industrial/Commercial
   □ Solar Technician — one trained in instrumentation, controls, design, maintenance, etc.
   □ Mech./Elec. Contractor
   □ General Contractor — Specializing in solar design/installation
     □ Do-it-yourselfer/Homeowner
   □ Person specializing in solar from one of the following trades/skills:
     □ Electrical □ Plumbing □ Sheet Metal
     □ Other (specify) _______________________________________________________
   □ Other (specify) _______________________________________________________

12. Estimate what percentage of graduates of the above Prog./Curr. enters the job market in the field for which they are specifically trained: _________%

13. Is your institution presently offering solar courses?      Yes □ No □

14. Are any (additional) solar courses being developed?      Yes □ No □

For all courses, existing or planned, please complete the 2-page Course Information Section. Make extra copies of the section if needed. If no solar-related courses are offered or planned, complete this page only and return.

Thank you very much.

A-4
II. Educational Data Base — Course Information

1. Name of Institution: ____________________________________________

2. Course Title: _____________________________________________

3. Course Number: _____ 4. Is Course Currently Offered? □ Or Planned? □

5. Course Instructor/Contact: ................................................. Phone: (____) ______

6. College/Dept. Offering Course: _______________________________

7. Is Course also taught in conjunction with other Colleges/Depts.? Yes □ No □

8. Most of the students in course are from what Colleges/Depts.? (Please List)
   a. ___________________________ b. ____________________________
   c. ___________________________ d. ____________________________
   e. ___________________________ f. Don't Know □

9. Number of Times Course Taught to Date: ______ 10. Average Enrollment_____

11. Number of Students Completing Course:
   1973 or earlier ______ 1974 ______ 1975 ______ 1976 ______
   1977 ______ 1978 (est.) ______ 1979 (est.) ______

12. Is Course Offered for Academic Credit? Yes □ No □

13. # Credit Hours ______

14. Typical Academic Level of Student Taking Course: All Levels □
   High School Grad. □ Fresh/Soph □ Jr/Sr □ College Grad. □ Postdoctoral □

15. Duration of Course: (# of Weeks ______ Hrs./Week ______) OR (# of Days ______ Hrs./Day ______)

16. Contract Hours: Total ______ Classroom/Lecture ______ Laboratory ______
   On-the-job-training ______ Other ______ (Specify) ______

17. To what extent are the following topics covered in your course? Check only those that apply. Please specify topics not listed, but included in the course.

<table>
<thead>
<tr>
<th>Course Topics</th>
<th>Course Topics</th>
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<tbody>
<tr>
<td>5. Energy Conversion</td>
<td>Solar Applications</td>
</tr>
<tr>
<td>8. Intro. to Solar Energy</td>
<td>27. Elec'1 Generation, Central</td>
</tr>
<tr>
<td>12. Photovoltaics</td>
<td>31. Space Heating</td>
</tr>
<tr>
<td>13. Plumbing Techniques</td>
<td>32. Space Cooling</td>
</tr>
<tr>
<td>15. Sheet Metal Techniques</td>
<td>34. Wind Power, Small Systems</td>
</tr>
<tr>
<td>16. Solar System Components</td>
<td>35. Other (specify)</td>
</tr>
<tr>
<td>17. Solar Economics</td>
<td>36. ______</td>
</tr>
<tr>
<td>18. Solar Home Construction</td>
<td>______</td>
</tr>
<tr>
<td>19. Solar Law/Legislation</td>
<td>______</td>
</tr>
</tbody>
</table>

Please complete back of form for this course. Thank you.
II. Educational Data Base — Course Information (Continued)

Materials Used or Proposed for Use in this Course

18. Is a text used in this course?  Yes □  No □

19. Name of text ____________________________  20. Author ________________________________

The following are used in this course:

21. Slides:  Yes □  No □  22. Films:  Yes □  No □  23. Demonstrations:  Yes □  No □

24. List sources of above materials or describe demonstrations.

25. Course Prerequisites (May be copied from catalog, etc.):

26. Course Description (May be copied from catalog, etc.):

Thank you very much for your participation.
## APPENDIX B

### SECOND NATIONAL SOLAR ENERGY EDUCATION INFORMATION UPDATE PACKAGE

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<tr>
<td>Part III - Solar Energy Course Information</td>
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</tr>
</tbody>
</table>
National Solar Energy Education Information Update

April 1979

To: Institutions Offering Educational Activities

U. S. Rep. Timothy E. Wirth

The Congressional Solar Coalition is interested in your continued participation in a cooperative effort to update the data base of all solar energy related programs and courses being offered by our nation's post-secondary educational institutions.

The Department of Energy's Solar Energy Research Institute (SERI) in Golden, Colorado has created a computerized data base as part of the Congressionally mandated Solar Energy Information Data Bank (SEIDB). SERI will receive returns, edit and process the data, and create the appropriate retrieval, reporting, updating and analysis mechanisms. The compilation of the material from the first data collection effort in the summer of 1978 was made available in the first edition of the National Solar Energy Education Directory (March 1979). In addition, the National Solar Heating and Cooling Information Center (NSHCIC) and the regional Solar Energy Centers provide listings of solar educational offerings on a state-by-state basis free of charge to anyone calling their toll-free number: (800) 523-2929; in Pennsylvania, (800) 462-4983; and in Hawaii and Alaska, (800) 523-4700.


To insure that all new and updated information is included in the next Directory, the deadline for returning the form is June 15, 1979. New courses and other program updates will be accepted at any time following the June 15th date. Even if you do not offer solar courses, please complete the first page and return the form.

We appreciate your participation and hope you will be able to use the compiled information. Your institution will receive notices of all publications created from the solar energy education data base.
Available Now!

National Solar Energy Education Directory

First Edition
a cooperative effort of the
Solar Energy Research Institute*
the office of
and the
Congressional Solar Coalition

... a comprehensive, up-to-date list
of solar-related courses, programs, and
curricula offered at 700 post-secondary
institutions nationwide. Information
was derived from a national survey of
all educational institutions of
higher education. The Directory
contains 279 pages, including
indexes. Produced from the
Solar Energy Information
Data Bank.

SERI
1536 Cole Boulevard
Golden, Colorado 80401

For a copy, write:
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number: 061-000-00210-3
Price: $4.75

* Operated for the U.S. Department of Energy
under Contract Number EG-77-C-01-4042
by the Midwest Research Institute
Instructions
National Solar Energy Education Survey
a cooperative effort of
The Solar Energy Research Institute*
The Office of U.S. Congressman George E. Brown, Jr.
The Congressional Solar Coalition

The Solar Energy Research Institute, in cooperation with the office of U.S. Congressman George E. Brown, Jr. and the Congressional Solar Coalition, is requesting information about your institution's activities in solar energy. Our goal is to provide a comprehensive guide to education and training efforts related to solar energy throughout the world. Your participation in this task is appreciated.

The enclosed survey form is designed to obtain information about solar-related courses and programs offered by institutions during 1979 or 1980. Your assistance in making the entries as complete as possible is of great value. This information will be used to update the Educational Data Base which is part of the Solar Energy Information Data Bank (SEIDB).

If your institution responded to the 1978 survey and is included in the National Solar Energy Education Directory**, First Edition, we have enclosed a computerized printout of the information that was submitted. Please review the printout, make corrections where necessary, and supply information where none is present. Also, please complete the provided survey sections with information on your institution's solar energy education offerings which are not listed on the computer printout.

If your institution is not presently listed in the National Solar Energy Education Directory, or if the Directory listing is created from a secondary source of information, we request that you complete the survey form provided.

If you offer no solar-related courses or programs, please complete only Part I of the survey.

On all solar-related courses and programs, we would appreciate receiving any additional information which you feel would be helpful.

Please observe the following guidelines in completing the survey:

Solar Technologies
- In addition to the more commonly recognized applications of solar heating, cooling, and electrification, consider wind, biomass conversion, and ocean thermal energy conversion as solar technologies.

Program Definitions
- A Solar Curriculum is a program in which the student receives a degree or diploma in a solar field — doctorate, master's, bachelor's, associate; e.g., "Master's in Solar Engineering"; "Associate Degree in Solar Installation".
- A Curriculum with Solar Study is a program in which the student receives solar education while working on a related degree or diploma — doctorate, master's, bachelor's, associate; e.g., "Doctorate in Physics" with solar emphasis; "Bachelor's in Architecture" with solar design experience.
- Solar Technical Training (Non-Academic Degree) is a program in which the student receives a certificate for study in solar energy or a solar-related field; e.g., solar technician.

Solar Course Definition
- A Solar Course or Solar-Related Course is a lecture, workshop, seminar, research project, laboratory, on-the-job training experience, or other educational experience where the solar content is equal to one-third (1/3) or more of the total course contact hours.

To insure accurate information in future publications, please return all surveys in the envelope provided by June 15, 1979. A further update or correction may be returned at any time to:

SERI, Academic Programs
Attn: George Corcoleotes
1536 Cole Boulevard
Golden, Colorado 80401

Call SERI, Academic Programs Branch, at (303) 231-1831 if you have any questions about this survey.

THANK YOU VERY MUCH FOR YOUR PARTICIPATION

* SERI (Solar Energy Research Institute) is a Division of Midwest Research Institute.
Part I — Institution Information
(1979-1980)

Please type or print legibly.

Institution Name
Address
City State Zip

IMPORTANT
We request the following information of the person filling out or coordinating the response to this survey.

Name Position
Department Phone ( ) Ext.

Institution Type (Circle single most appropriate response):

University/College/Graduate School
Junior/Community College
Vocational/Technical School
Research Institute/Laboratory
Trade Association
Labor Organization
Industrial Organization
Government Organization
Adult/Community Education
Political Action Group
Professional Association
Other

What is your institution's total educational enrollment?

Control or affiliation of your institution (Circle one):

Public Private Combination—Public/Private

What is the minimum admission level for students attending your institution? (Circle one)

Only the ability to profit from attendance
High school graduate or equivalent
High school graduate and superior academic aptitude
Two-year college graduate

How is your school year divided? (Circle one)

Semester Quarter Trimester Not Applicable Other (Specify)

If you have no solar-related programs or courses, circle the response, stop here, and return this part of the survey. Thank you.

If you have solar-related programs or courses, please go to Part II.

NOTE: If more than one solar program is offered during 1979 or 1980, please make copies of this part for each.

Which of the following programs does your institution offer or plan to offer during 1979 or 1980? NOTE: Please see Program Definitions on instruction page.

SC Solar Curriculum, Awarding a Degree or Diploma in a Solar Field
SS Curriculum with Solar Study, Awarding a Degree or Diploma in a Solar-Related Field
ST Solar Technical Training, Awarding a Certificate for Study in Solar Energy or a Solar-Related Field

If you have not circled one of the above program types, go to Part III.

Program Name:
Department Offering Program:
Head of Program:
5. Phone: (__) Ext.
What degree does the student receive? (Circle appropriate responses)
D Doctorate  B Bachelor's  C Certificate
M Master's  A Associate  O Other (Specify)
7. What is the discipline or subject area of the above degree type?
Estimate the number of students completing the above program for the years indicated:
As a result of having completed the above program, students will be trained in the following area(s) (Circle as many as apply):
ARC Architecture—Solar Specialization  INR Solar System Installation—Residential
EDU Solar Energy Education  INI Solar System Installation—Industrial/Commercial
ADM Solar Energy Administration/Policy  SOT Solar Technology—Training in Instrumentation, Controls, Design Maintenance, Etc.
RES Scientific Research and Development in Solar Energy  ELE Electricity—Solar Specialization
ENG Engineering—Solar Specialization  PLB Plumbing—Solar Specialization
MEC Mechanical/Electrical Contracting Solar Specialization  SHM Sheet Metal—Solar Specialization
CON General Contracting—Specialization in Solar Design/Installation  HOM Do-It-Yourself/Home Installation
HVC Heating, Ventilation, Air Conditioning—Solar Specialization

Does your institution offer a job placement service?  Yes  No
Does your institution have any procedures for following student employment after program completion?  Yes  No
12. If yes, what is the estimate of the percentage of students who find employment in the field for which they are specifically trained as a result of having completed the above program: __________

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1. __________
2. __________
3. __________
4. __________
5. __________
6. __________
7. __________
8. '73 __________
   '74 __________
   '75 __________
   '76 __________
   '77 __________
   '78 __________
   '79 __________
   '80 __________
   '81 __________
9. __________
10. __________
11. __________
12. __________

B-6

NOTE: If more than one solar course is offered during 1979 or 1980, please make copies of this part for each.

Course Title: ____________________________

2. Course No.: ____________________________

Instructor or Contact Person: ____________________________

4. Phone: (___) ________ Ext. ________

Department Offering Course: ____________________________

Is course also taught in conjunction with other departments/schools? [Yes] [No]

Is course part of a program described in Part II of this survey? [Yes] [No]

If yes, give program name: ____________________________

Number of times course taught to date: ____________________________

Average enrollment per class: ____________________________

Estimate the number of students completing the course for the years indicated:


Is the course offered for academic credit? [Yes] [No]

If yes, how many credits? ____________________________

Are continuing education units offered for this course? [Yes] [No]

If yes, how many units? ____________________________

Level for which course is offered:

Academic Level: ____________________________

Non-Academic Level: ____________________________

AL All Levels

CG College Graduate

JS College Junior/Senior

FS College Freshman/Sophomore

OA Other (Specify) ____________________________

Duration of Course:

No. of weeks ____________________________

Hours per week ____________________________

Total Course Contact Hours ____________________________

OR

No. of Days ____________________________

Hours Per Day ____________________________

Total Course Contact Hours ____________________________

Detailed Course Contact Hours for Duration of Course:

Lecture/Discussion ____________________________ Hrs.

Seminar ____________________________ Hrs.

Research/Independent Study ____________________________ Hrs.

Workshop ____________________________ Hrs.

On-the-Job Training ____________________________ Hrs.

Laboratory ____________________________ Hrs.

Other (Specify) ____________________________ Hrs.

When is this course offered? (Circle as may as apply):

D Day E Evening W Weekend

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1. ____________________________

2. ____________________________

3. ____________________________

4. ____________________________

5. ____________________________

6. ____________________________

7. ____________________________

8. ____________________________

9. ____________________________

10. ____________________________

11. '73 ____________________________

12. '74 ____________________________

13. '75 ____________________________

14. '76 ____________________________

15. '77 ____________________________

16. '78 ____________________________

17. '79 ____________________________

18. '80 ____________________________

19. '81 ____________________________

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1. Tuition and fees for a full-time student for one term:
   $_________ Resident
   $_________ Non-resident

2. Tuition and fees for a student taking just this course:
   $_________ Resident
   $_________ Non-resident

2. What are the principal texts used in this course?

<table>
<thead>
<tr>
<th>AUTHOR</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Are there any prerequisites for taking this course?  Yes  No

4. To what extent are the following topics covered in this course? Circle a 1 or 2 using the following code definitions:
   1-Topic Covered Extensively (Major course topic or concept)
   2-Topic Covered In Some Detail (Minor course topic or concept)
   Do not code topics covered superficially.

<table>
<thead>
<tr>
<th>Code</th>
<th>Topic</th>
<th>Code</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>ALTE - Alternate Energy Sources</td>
<td>2</td>
<td>SSPS - Satellite Solar Power Systems</td>
</tr>
<tr>
<td>1</td>
<td>APRT - Appropriate Technology</td>
<td>2</td>
<td>SHMT - Sheet Metal Techniques</td>
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<td>1</td>
<td>BIOM - Bioconversion</td>
<td>2</td>
<td>SHAC - Solar Cooling</td>
</tr>
<tr>
<td>1</td>
<td>CENT - Centralized Solar Power Systems</td>
<td>2</td>
<td>HOTW - Solar Domestic Hot Water</td>
</tr>
<tr>
<td>1</td>
<td>COMP - Components-Solar</td>
<td>2</td>
<td>POLD - Solar Energy Policy Development</td>
</tr>
<tr>
<td>1</td>
<td>DIST - Distributed Solar Power Systems</td>
<td>2</td>
<td>SHAK - Solar Heating</td>
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<tr>
<td>1</td>
<td>CNSV - Energy Conservation</td>
<td>2</td>
<td>CNST - Solar Home Construction</td>
</tr>
<tr>
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<td>STOR - Energy Storage Systems</td>
<td>2</td>
<td>LAWL - Solar Law/Legislation</td>
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<tr>
<td>1</td>
<td>GRHT - Greenhouse Techniques</td>
<td>2</td>
<td>MRKT - Solar Marketing/Economic Analysis</td>
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<tr>
<td>1</td>
<td>HETR - Heat and Energy Transfer</td>
<td>2</td>
<td>SWPL - Solar Swimming Pool Heating</td>
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<tr>
<td>1</td>
<td>HYBR - Hybrid Systems</td>
<td>2</td>
<td>SSYD - Solar Systems Design</td>
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<tr>
<td>1</td>
<td>INTR - Introduction to Solar Energy</td>
<td>2</td>
<td>INST - Solar Systems Install./Maintenance</td>
</tr>
<tr>
<td>1</td>
<td>MATR - Materials</td>
<td>2</td>
<td>TEST - Solar Systems Testing/Evaluation</td>
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<tr>
<td>1</td>
<td>SEAS - Ocean Systems</td>
<td>2</td>
<td>CHEM - Thermochemical Conversion</td>
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<td>1</td>
<td>PASS - Passive Solar Systems</td>
<td>2</td>
<td>WIND - Wind Energy Conversion Systems</td>
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<td>1</td>
<td>PHOT - Photoconversion</td>
<td>2</td>
<td>OTHR - Other (Specify)</td>
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<td>PHVC - Photovoltaics and Solar Cells</td>
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<td>1</td>
<td>PLMB - Plumbing Techniques</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>PROC - Process Heat</td>
<td>2</td>
<td></td>
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</tbody>
</table>

20. R      NR
21. R      NR
22.        
23.        
24.        

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