# SWARTHMORE COLLEGE,

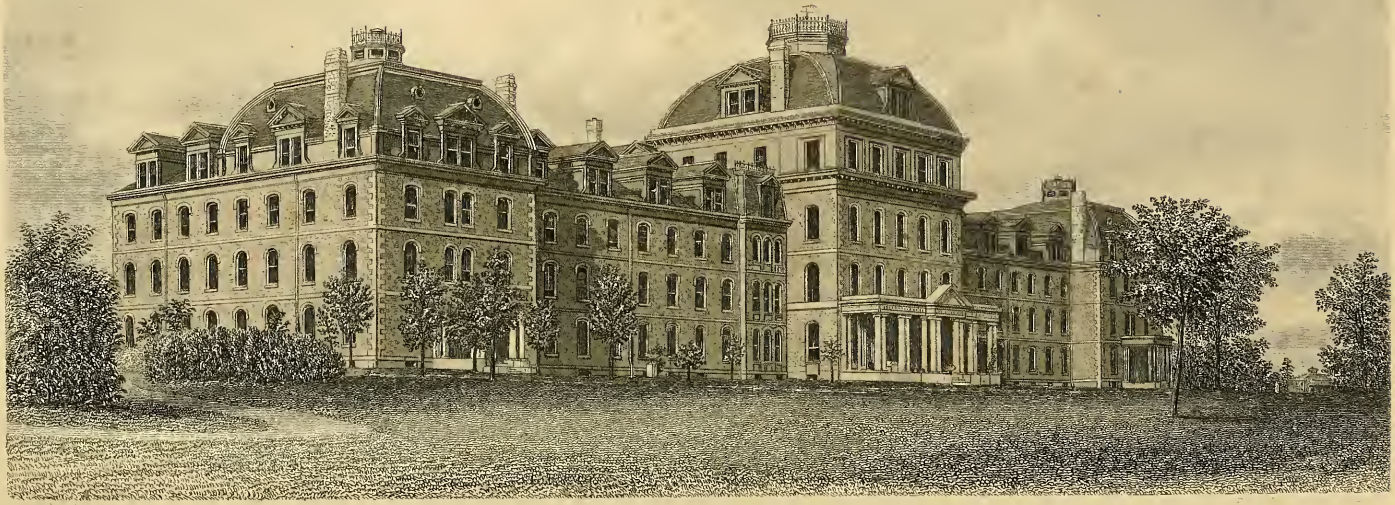
1888-89.

| 1888 | 1st Day. | 2d Day. | 3d Day. | 4th Day. | 5th Day. | 6th Day. | 7th Day. |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Seventh | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| Month. | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| | 29 | 30 | 31 | . | . | . | . |
| | . | . | . | 1 | 2 | 3 | 4 |
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Eighth | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Month. | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| | 26 | 27 | 28 | 29 | 30 | 31 | . |
| | . | . | . | . | . | . | 1 |
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Ninth | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Month. | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| | 30 | . | . | . | . | . | . |
| | . | 1 | 2 | 3 | 4 | 4 | 6 |
| Tenth | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Month. | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| | 21 | 22 | 23 | 24 | 25 | 16 | 27 |
| | 28 | 29 | 30 | 31 | . | . | . |
| | . | . | . | . | 1 | 2 | 3 |
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Eleventh | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| Month. | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | 25 | 26 | 27 | 28 | 29 | 30 | . |
| | . | . | . | . | . | . | 1 |
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Twelfth | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Month. | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| | 30 | 31 | . | . | . | . | . |

| 1889 | 1st Day. | 2d Day. | 3d Day. | 4th Day. | 5th Day. | 6th Day. | 7th Day. |
|---|---|---|---|---|---|---|---|
| | . | . | 1 | 2 | 3 | 4 | 5 |
| | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| First | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| Month. | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | 27 | 28 | 29 | 30 | 31 | . | . |
| | . | . | . | . | . | 1 | 2 |
| | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Second | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Month. | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| | 24 | 25 | 26 | 27 | 28 | . | . |
| | . | . | . | . | . | 1 | 2 |
| | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Third | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Month. | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| | 31 | . | . | . | . | . | . |
| | . | 1 | 2 | 3 | 4 | 5 | 6 |
| Fourth | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Month. | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| | 28 | 29 | 30 | . | . | . | . |
| | . | . | . | 1 | 2 | 3 | 4 |
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Fifth | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Month. | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| | 26 | 27 | 28 | 29 | 30 | 31 | . |
| | . | . | . | . | . | . | 1 |
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Sixth | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Month. | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| | 30 | . | . | . | . | . | . |

| 1889 | 1st Day. | 2d Day. | 3d Day. | 4th Day. | 5th Day. | 6th Day. | 7th Day. |
|---|---|---|---|---|---|---|---|
| | . | 1 | 2 | 3 | 4 | 5 | 6 |
| | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Seventh | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Month. | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| | 28 | 29 | 30 | 31 | . | . | . |
| | . | . | . | . | 1 | 2 | 3 |
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Eighth | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| Month. | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| | . | . | . | . | . | . | . |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Ninth | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Month. | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| | 29 | 30 | . | . | . | . | . |
| | . | . | 1 | 2 | 3 | 4 | 5 |
| Tenth | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Month. | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | 27 | 28 | 29 | 30 | 31 | . | . |
| | . | . | . | . | . | 1 | 2 |
| | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Eleventh | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| Month. | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| | . | . | . | . | . | . | . |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Twelfth | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Month. | 15 | 16 | 17 | 18 | 18 | 20 | 21 |
| | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| | 29 | 30 | 31 | . | . | . | . |

| 1890 | 1st Day. | 2d Day | 3d Day. | 4th Day. | 5th Day. | 6th Day. | 7th Day. |
|---|---|---|---|---|---|---|---|
| | . | . | . | 1 | 2 | 3 | 4 |
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| First | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Month. | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| | 26 | 27 | 28 | 29 | 30 | 31 | . |
| | . | . | . | . | . | . | 1 |
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Second | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Month. | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | 23 | 24 | 25 | 26 | 27 | 28 | . |
| | . | . | . | . | . | . | 1 |
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Third | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Month. | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| | 30 | 31 | . | . | . | . | . |
| | . | . | 1 | 2 | 3 | 4 | 5 |
| Fourth | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Month. | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | 27 | 28 | 29 | 30 | . | . | . |
| | . | . | . | . | 1 | 2 | 3 |
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Fifth | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| Month. | 18 | 29 | 20 | 21 | 22 | 23 | 24 |
| | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| | . | . | . | . | . | . | . |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Sixth | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Month. | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| | 29 | 30 | . | . | . | . | . |



SWARTHMORE COLLEGE.

TWENTIETH

# ANNUAL CATALOGUE

OF

# SWARTHMORE COLLEGE,

*SWARTHMORE, PA.*

1888–1889

PRESS OF
FRIENDS' BOOK ASSOCIATION,
S. W. Cor. 15TH AND RACE STREETS, PHILADELPHIA.

# Contents.

# CALENDAR.

## 1888–89.

| | | |
|---|---|---|
| 1888. | Ninth Month, 11th, Third-day | Meeting of the Board of Managers. |
| " | Ninth Month, 11th, Third-day | Examinations for Admission began. |
| " | Ninth Month, 12th, Fourth-day | Examinations for Admission completed, and old students returned. |
| " | Ninth Month, 13th, Fifth-day | Regular Exercises began. |
| " | Twelfth Month, 3d, Second-day | Meeting of the Board of Managers. |
| " | Twelfth Month, 4th, Third-day | *Annual Meeting of Stockholders.* |
| " | Twelfth Month, 4th, Third-day | Meeting of the Board of Managers. |
| " | Twelfth Month, 22d, Seventh-day | Winter Recess begins. |
| 1889. | First Month, 2d, Fourth-day | Students return and register. |
| " | First Month, 3d, Fifth-day | Regular Exercises begin. |
| " | Second Month, 2d, Seventh-day | First Semester ends. |
| " | Second Month, 4th, Second-day | Second Semester begins. |
| " | Second Month, 11th, Second-day | Commencement Appointments announced. |
| " | Third Month, 12th, Third-day | Meeting of the Board of Managers. |
| " | Fourth Month, 17th, Fourth-day | Spring Recess begins. |
| " | Fourth Month, 24th, Fourth-day | Students return and register. |
| " | Fifth Month, 1st, Fourth-day | Candidates for Degrees present Theses. |
| " | Fifth Month, 27th, Second-day | Senior Examinations begin. |
| " | Sixth Month, 3d, Second-day | Senior Examinations completed and the results announced. |
| " | Sixth Month, 10th, Second-day | Final Examinations begin. |
| " | Sixth Month, 14th, Sixth-day<br>" Sixth Month, 15th, Seventh-day | Examinations for Admission. |
| " | Sixth Month, 17th, Second-day | Class Day Exercises. |
| " | Sixth Month, 17th, Second-day | Meeting of the Board of Managers. |
| " | Sixth Month, 18th, Third-day | *Commencement.* |
| " | Ninth Month, 10th, Third-day | Meeting of the Board of Managers. |
| " | Ninth Month, 10th, Third-day | New Students arrive. |
| " | Ninth Month, 11th, Fourth-day | Examinations for Admission; and old students return. |
| " | Ninth Month, 12th, Fifth-day | Regular Exercises begin. |
| " | Twelfth Month, 2d, Second-day | Meeting of the Board of Managers. |
| " | Twelfth Month, 3d, Third-day | *Annual Meeting of the Stockholders.* |
| " | Twelfth Month, 3d, Third-day | Meeting of the Board of Managers. |
| " | Twelfth Month, 21st, Seventh-day | Winter Recess begins. |
| 1890. | First Month, 2d, Fifth-day | Students return and register. |
| " | First Month, 3d, Sixth-day | Regular Exercises begin. |

# CORPORATION.

## OFFICERS.

### CLERKS.

GEORGE W. HANCOCK . . . . . *40th St. and Lancaster Ave., Phila.*
FANNIE WILLETS LOWTHORP . . . . . *Trenton, N. J.*

### TREASURER.

ROBERT BIDDLE . . . . . *511 Commerce Street, Philadelphia.*

### BOARD OF MANAGERS.

#### *Term expires Twelfth Month, 1889.*

JOHN T. WILLETS . . . . . *303 Pearl Street, New York.*
CHARLES M. BIDDLE . . . . . *511 Commerce Street, Philadelphia.*
DANIEL UNDERHILL . . . . . *Jericho, L. I.*
EMMOR ROBERTS . . . . . *Fellowship, N. J.*
JANE P. DOWNING . . . . . *1613 Race Street, Philadelphia.*
SARAH H. POWELL . . . . . *324 West 58th Street, New York.*
HELEN COMLY WHITE . . . . . *Lansdowne, Pa.*
ELIZABETH B. PASSMORE . . . . . *Oxford, Chester County, Pa.*

#### *Term expires Twelfth Month, 1890.*

ISAAC H. CLOTHIER . . . . . *8th and Market Streets, Phila.*
JAMES V. WATSON . . . . . *718 Franklin Street, Philadelphia.*
HERMAN HOOPES . . . . . *609 Chestnut Street, Philadelphia.*
MARTHA G. McILVAIN . . . . . *59th St. and Elmwood Ave., Phila.*
SOPHIA U. WILLETS . . . . . *Manhasset, L. I.*
EDMUND WEBSTER . . . . . *1156 South Broad Street, Phila.*
EMMA McILVAIN . . . . . *59th St. and Elmwood Ave., Phila.*
REBECCA C. LONGSTRETH . . . . . *Sharon Hill, Delaware County, Pa.*

### Term expires Twelfth Month, 1891.

JOSEPH WHARTON . . . . . *P. O. Box 1332, Philadelphia.*
M. FISHER LONGSTRETH . . . . . *Sharon Hill, Delaware County, Pa.*
MARY WILLETS . . . . . *Trenton, N. J.*
LYDIA H. HALL . . . . . *West Chester, Pa.*
WILSON M. POWELL . . . . . *324 W. 58th St., New York.*
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WILLIAM M. JACKSON . . . . . *335 W. 18th St., New York.*
RACHEL W. HILLBORN . . . . . *Swarthmore, Pa.*

### Term expires Twelfth Month, 1892.

EDWARD H. OGDEN . . . . . *314 Vine Street, Philadelphia.*
ELI M. LAMB . . . . . *1432 McCulloh St., Baltimore, Md.*
ANNA M. HUNT . . . . . *Lansdowne, Pa.*
SUSAN W. LIPPINCOTT . . . . . *Cinnaminson, N. J.*
SARAH H. MERRITT . . . . . *3 Monroe Place, Brooklyn, L. I.*
CLEMENT M. BIDDLE . . . . . *815 Arch Street, Philadelphia.*
EDWARD STABLER, Jr. . . . . *3 South Street, Baltimore, Md.*
HANNAH H. WOODNUTT . . . . . *1528 Arch Street, Philadelphia.*

# OFFICERS AND COMMITTEES OF THE BOARD.

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## SECRETARY.

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## INSTRUCTION.

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EMMOR ROBERTS, LYDIA H. HALL,
HERMAN HOOPES, ANNA M. HUNT,
MARY WILLETS, HELEN COMLY WHITE,
SUSAN W. LIPPINCOTT, RACHEL W. HILLBORN.

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ANNA M. HUNT, GEORGE W. HANCOCK.

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LYDIA H. HALL, WILLIAM M. JACKSON.

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CHARLES M. BIDDLE.

## BUILDING AND PROPERTY.

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EMMOR ROBERTS,
DANIEL UNDERHILL,
GEORGE W. HANCOCK,
EDMUND WEBSTER,
ISAAC H. CLOTHIER.

## TRUSTS, ENDOWMENTS AND SCHOLARSHIPS.

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DANIEL UNDERHILL,
EDWARD H. OGDEN,
CLEMENT M. BIDDLE, *Treasurer*,
M. FISHER LONGSTRETH, *Secretary*.

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DANIEL UNDERHILL,
CHARLES M. BIDDLE,
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HERMAN HOOPES,
EDWARD H. OGDEN,
ELI M. LAMB,
MARTHA G. McILVAIN,
JANE P. DOWNING,
ANNA M. HUNT,
SUSAN W. LIPPINCOTT,
EMMA McILVAIN,
HANNAH H. WOODNUTT,
MARY C. CLOTHIER,
ELIZABETH B. PASSMORE,
*Ex-officio*, M. FISHER LONGSTRETH.

# FACULTY.*

EDWARD H. MAGILL, President.

ELIZABETH POWELL BOND, Matron

Prof. ARTHUR BEARDSLEY.

Prof. WILLIAM HYDE APPLETON.

Prof. SUSAN J. CUNNINGHAM.

Prof. HENRY W. ROLFE.

Prof. WILLIAM PENN HOLCOMB.

Prof. BENJAMIN SMITH.

Prof. WILLIAM C. DAY.

Asst.-Prof. FERRIS W. PRICE.

WILLIAM J. HALL, Superintendent.

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*By-Law IX.—"The President, Matron, and such of the resident Professors and others as may be elected by the Board, shall constitute the Faculty. They shall hold regular meetings, arrange the course of study, determine the qualifications for admission and for graduation, decide upon rules of order, and determine all questions pertaining to the discipline or instruction, subject to the approval of the Executive Committee, to whom they shall report monthly."

# OFFICERS OF INSTRUCTION.*

EDWARD H. MAGILL, LL.D.,

*President, and Professor of French.*

JOSEPH LEIDY, M.D., LL.D.,

*Emeritus Professor of Natural History, and Curator of the Museum.*

ARTHUR BEARDSLEY, C.E.,

*I. V. Williamson Professor of Engineering, and Director of the Workshops.*

WILLIAM HYDE APPLETON, A.M., Ph. D.

*Professor of Greek and of English Literature.*

SUSAN J. CUNNINGHAM, Sc. D.,

*Edward H. Magill Professor of Mathematics and Astronomy.*

HENRY W. ROLFE, A.M.,

*Isaac H. Clothier Professor of Latin.*

WILLIAM PENN HOLCOMB, Ph. D.,

*Joseph Wharton Professor of History and Political Science, and Lecturer on Pedagogics.*

BENJAMIN SMITH, A.M.,

*Professor of Rhetoric, Logic, Mental and Moral Philosophy.*

WILLIAM CATHCART DAY, Ph. D.,

*Professor of Chemistry.*

* Arranged, with the exception of the President, in the order of appointment, by classes: Professors, Assistant Professors, and Instructors.

SPENCER TROTTER, M.D.,

*Professor of Natural History, and Lecturer on Physiology and Hygiene to the Young Men.*

MILTON H. BANCROFT,

*Professor of Art and of Mechanical Draughting.*

GEORGE M. HOADLEY, C.E.,

*Professor of Physics.*

FERRIS W. PRICE, A.M.,

*Assistant Professor of Latin.*

GERRIT E. H. WEAVER,

*Assistant Professor in charge of German.*

MYRTIE E. FURMAN, B.O.,

*Assistant Professor in charge of Elocution.*

FRANK CAWLEY, B.S.,

*Instructor in Shop Work.*

MARY J. MURPHY,

*Director of Physical Culture for the Young Women.*

J. K. SHELL, M.D.,

*Director of Physical Culture for the Young Men.*

ELIZABETH L. PECK, M.D.,

*Lecturer on Physiology and Hygiene to the Young Women.*

SARAH M. NOWELL,

*Librarian.*

# STUDENTS.

## SENIOR CLASS.

| *Names.* | *Courses.* | *Residences.* |
|---|---|---|
| Justin K. Anderson | Engineering | *Unionville, Pa.* |
| Alexander G. Cummins, Jr. | Arts | *Smyrna, Del.* |
| Howard A. Dill | Engineering | *Richmond, Ind.* |
| Horace B. Forman, Jr. | Engineering | *New York, N. Y.* |
| Ellis M. Harvey | Engineering | *Ward, Pa.* |
| Clara Haydock | Letters | *New York, N. Y.* |
| J. Carroll Hayes | Arts | *West Chester, Pa.* |
| Julia Hicks | Science | *Old Westbury, N. Y.* |
| Mary Kirk | Arts | *Lumber City, Pa.* |
| Margaret J. Laurie | Arts | *Jericho, N. Y.* |
| George A. Masters | Engineering | *Philadelphia, Pa.* |
| Alice S. Palmer | Arts | *West Chester, Pa.* |
| Louella Passmore | Arts | *Oxford, Pa.* |
| Frederic B. Pyle | Engineering | *London Grove, Pa.* |
| Ralph Stone | Arts | *Wilmington, Del.* |
| Elsie D. Stoner | Letters | *Columbia, Pa.* |
| James V. Upson | Irregular | *San Antonio, Texas.* |
| Willis W. Vail | Engineering | *Quakertown, N. J.* |
| Jennie F. Waddington | Science | *Salem, N. J.* |

## JUNIOR CLASS.

| *Names.* | *Courses.* | *Residences.* |
|---|---|---|
| Alvan W. Atkinson | Arts | *Buckingham, Pa.* |
| Sara H. Atkinson | Arts | *Holicong, Pa.* |
| George H. Bartram | Science | *Milltown, Pa.* |
| Frederic T. Berdan | Irregular | *Toledo, Ohio.* |
| William O. Bernard | Irregular | *New Orleans, La.* |
| Martha M. Biddle | Letters | *Riverton, N. J.* |
| Emma J. Broomell | Science | *Baltimore, Md.* |

| *Names.* | *Courses.* | *Residences.* |
|---|---|---|
| Edgar A. Brown | Science | *Mt. Pleasant, Ohio.* |
| Morris L. Clothier | Science | *Wynnewood, Pa.* |
| Beulah W. Darlington | Arts | *Darling, Pa.* |
| Edward Darlington | Engineering | *Darling, Pa.* |
| George Ellsler | Arts | *Baltimore, Md.* |
| Caroline R. Gaston | Arts | *Honey Brook, Pa.* |
| John C. Gifford | Science | *May's Landing, N. J.* |
| Abby M. Hall | Arts | *West Chester, Pa.* |
| Clara A. Hughes | Arts | *Lima, Ohio.* |
| Samuel R. Lippincott | Science | *Cinnaminson, N. J.* |
| William D. Lippincott | Engineering | *Cinnaminson, N. J.* |
| Willard L. Maris | Science | *West Chester, Pa.* |
| Eloise Mayham | Arts | *Stamford, N. Y.* |
| Robert S. McConnell | Engineering | *Philadelphia, Pa.* |
| Fannie E. Ottley | Arts | *Austin, Texas.* |
| Mary D. Palmer | Arts | *Ward, Pa.* |
| Mary E. Pancoast | Letters | *Marple, Pa.* |
| Nellie Passmore | Letters | *Oxford, Pa.* |
| James W. Ponder | Arts | *Milton, Del.* |
| Ellis B. Ridgway | Engineering | *Coatesville, Pa.* |
| Walter Roberts | Arts | *Fellowship, N. J.* |
| Richard C. Sellers | Engineering | *Swarthmore, Pa.* |
| Fannie B. Smith | Arts | *Swarthmore, Pa.* |
| Mary F. Soper | Science | *Jersey City, N. J.* |
| R. Barclay Spicer | Arts | *Baltimore, Md.* |
| William E. Sweet | Arts | *Colorado Springs, Col.* |
| Alice W. Titus | Letters | *Old Westbury, N. Y.* |
| Rebecca S. Webb | Arts | *Philadelphia, Pa.* |
| Mary H. White | Arts | *Lansdowne, Pa.* |

## SOPHOMORE CLASS.

| *Names.* | *Courses.* | *Residences.* |
|---|---|---|
| Elizabeth B. Ambler | Irregular | *Belfry, Pa.* |
| Josephine T. Ancona | Irregular | *Reading, Pa.* |
| Rosa Ancona | Irregular | *Reading, Pa.* |
| Emily Atkinson | Arts | *Moorestown, N. J.* |
| M. Rosamond Baker | Arts | *Easton, N. Y.* |

| | | |
|---|---|---|
| Helen P. Barnard | Irregular | *Doe Run, Pa.* |
| Harry L. Boggs | Engineering | *Charleston, W. Va.* |
| Samuel S. Bond | Engineering | *Spencerville, Md.* |
| Joseph Bringhurst | Engineering | *Wilmington, Del.* |
| Robert H. Brooke | Engineering | *Sandy Spring, Md.* |
| Cosmelia J. Brown | Letters | *Lincoln, Va.* |
| Samuel N. Brown | Engineering | *Lincoln, Va.* |
| Louis P. Clark | Engineering | *Philadelphia, Pa.* |
| Hannah H. Clothier | Letters | *Wynnewood, Pa.* |
| James S. Coale | Science | *Riverton, N. J.* |
| Annie L. Croasdale | Irregular | *Jenkintown, Pa.* |
| Eva M. Daniels | Science | *Charleston, W. Va.* |
| Grant Dibert | Irregular | *Johnstown, Pa.* |
| J. Lawrence Dudley | Irregular | *Washington, D. C.* |
| Margaret M. Freeman | Letters | *Orchard Park, N. Y.* |
| Eliza R. Hampton | Arts | *Spring Brook, N. Y.* |
| Isaac O. Harper | Engineering | *Baltimore, Md.* |
| Esther Haviland | Letters | *Brooklyn, N. Y.* |
| Eliza G. Holmes | Arts | *Moorestown, N. J.* |
| John W. Hutchinson, Jr. | Engineering | *New York, N. Y.* |
| Elizabeth H. Janney | Irregular | *Lincoln, Va.* |
| Elizabeth C. Jessup | Arts | *Cinnaminson, N. J.* |
| Samuel R. Kirk | Engineering | *Curwensville, Pa.* |
| G. Wilmer Koser | Science | *Guernsey, Pa.* |
| Dora Lewis | Irregular | *Media, Pa.* |
| Lucy S. Lippincott | Arts | *Riverton, N. J.* |
| Chester P. Martindale | Letters | *Oxford, Pa.* |
| Harry L. McDonald | Engineering | *Kansas City, Mo.* |
| William A. Mode | Engineering | *Modena, Pa.* |
| Sarah T. Moore | Letters | *Sandy Spring, Md.* |
| Mary J. Murphy | Irregular | *Philadelphia, Pa.* |
| A. Mitchell Palmer | Arts | *Stroudsburg, Pa.* |
| Mary R. Phillips | Irregular | *New York, N. Y.* |
| Bertha C. Rolfe | Irregular | *Swarthmore, Pa.* |
| Horton C. Ryan | Irregular | *Lincoln, Va.* |
| Albert H. Smith | Irregular | *Hamilton, Va.* |
| William C. Sproul | Science | *Chester, Pa.* |
| Frederick E. Stone | Arts | *Wilmington, Del.* |
| Edward B. Temple | Engineering | *Ward, Pa.* |

| | | |
|---|---|---|
| Katherine L. Tyler | Science | *Wilmington, Del.* |
| Zaida E. Udell | Letters | *Grand Rapids, Mich.* |
| Evangeline Vail | Science | *Quakertown, N. J.* |
| Horace G. Vernon | Engineering | *Mt. Cuba, Del.* |
| Jane Watson | Irregular | *Doylestown, Pa.* |
| Edward C. Wilson | Science | *Bloomfield, Ont., Can.* |
| M. Lilian Yarnall | Arts | *Ward, Pa.* |

## FRESHMAN CLASS.

| *Names.* | *Courses.* | *Residences.* |
|---|---|---|
| William G. Arey | Arts | *Albert Lea, Minn.* |
| M. Ellen Atkinson | Arts | *Buckingham, Pa.* |
| Maurice J. Brinton | Science | *Christiana, Pa.* |
| Mary P. Brown | Letters | *Lincoln, Va.* |
| Theodate P. Brown | Letters | *Lincoln, Va.* |
| Frederic C. Carr | Engineering | *Charleston, West Va.* |
| Mary A. Cawley | Science | *Woodstown, N. J.* |
| George T. Cochran | Irregular | *Alexandria, Va.* |
| Henry B. Coles | Science | *Moorestown, N. J.* |
| Caroline M. Crisfield | Irregular | *Princess Anne, Md.* |
| Walter E. Davis | Engineering | *Scranton, Pa.* |
| Frank E. Dill | Science | *Richmond, Ind.* |
| Roberta B. Dixon | Irregular | *Easton, Md.* |
| William L. Donohugh | Engineering | *Roxborough, Phila., Pa.* |
| Robert N. Fell | Engineering | *Holicong, Pa.* |
| Elisha Freeman | Engineering | *Orchard Park, N. Y.* |
| Ralph Greason | Irregular | *Greason, Pa.* |
| Charles Hart | Science | *Doylestown, Pa.* |
| Thomas E. Harvey | Irregular | *Columbus, N. J.* |
| William C. R. Hazard | Irregular | *Buffalo, N. Y.* |
| Annie Hillborn | Irregular | *Swarthmore, Pa.* |
| Gertrude Hutchings | Irregular | *San Francisco, Cal.* |
| Caroline U. Jackson | Letters | *Jericho, N. Y.* |
| Herbert C. Kendall | Engineering | *Reading, Pa.* |
| Charles B. Ketcham | Arts | *Dover Plains, N. Y.* |
| Phebe H. Ketcham | Science | *Jericho, N. Y.* |
| Ralph Lewis | Irregular | *Swarthmore, Pa.* |
| Carlie McClure | Arts | *Girard, Pa.* |

| | | |
|---|---|---|
| Bernard S. McIlvain | Engineering | *Churchville, Md.* |
| John F. Murray | Engineering | *Wallingford, Pa.* |
| Howard F. Nichols | Irregular | *Philomont, Va.* |
| Henry T. Pancoast | Science | *Lincoln, Va.* |
| Georgia Porter | Irregular | *Worton, Md.* |
| Mary R. Price | Irregular | *Baltimore, Md.* |
| Ellen Pyle | Arts | *London Grove, Pa.* |
| Harry F. Randolph | Engineering | *Johnstown, Pa.* |
| Florence D. Reid | Arts | *West Chester, Pa.* |
| Eloise Reppert | Irregular | *Old Frame, Pa.* |
| John H. Ruckman | Engineering | *Lahaska, Pa.* |
| Anna C. Rushmore | Arts | *Cooksburg, N. Y.* |
| Gertrude A. Ryan | Irregular | *Washington, D. C.* |
| Susan B. Seymour | Irregular | *Philadelphia, Pa.* |
| Hannah T. Shreve | Arts | *Mt. Holly, N. J.* |
| Laura M. Smith | Irregular | *San Francisco, Cal.* |
| John B. Stetson | Engineering | *Lansdale, Pa.* |
| Clarence D. Stoner | Engineering | *Columbia, Pa.* |
| Charles E. H. Sudler | Arts | *Sudlersville, Md.* |
| Caroline Taylor | Letters | *Philomont, Va.* |
| William F. Thomas | Science | *Ednor, Md.* |
| Edith N. Trump | Irregular | *Wilmington, Del.* |
| Edwin M. Underwood | Irregular | *Elizabeth City, N. C.* |
| Susan N. Van Trump | Letters | *Wilmington, Del.* |
| Hamilton M. Walker | Irregular | *Philadelphia, Pa.* |
| James M. Walker | Engineering | *Waterford, Va.* |
| Mary B. Walker | Irregular | *Philadelphia, Pa.* |
| William W. Wharton | Irregular | *Philadelphia, Pa.* |
| Lillie C. White | Irregular | *Easton, Md.* |
| Florence N. Wolverton | Arts | *Quakertown, N. J.* |
| Mary L. Wolverton | Arts | *Quakertown, N. J.* |

# SUMMARY.

| | |
|---|---|
| Seniors | 19 |
| Juniors | 36 |
| Sophomores | 51 |
| Freshmen | 59 |
| Total | 165 |

## SUMMARY BY STATES.

| | |
|---|---|
| Pennsylvania | 70 |
| New Jersey | 20 |
| New York | 18 |
| Maryland | 15 |
| Virginia | 12 |
| Delaware | 9 |
| Ohio | 3 |
| West Virginia | 3 |
| California | 2 |
| Indiana | 2 |
| Texas | 2 |
| District of Columbia | 2 |
| Colorado | 1 |
| Louisiana | 1 |
| Michigan | 1 |
| Minnesota | 1 |
| Missouri | 1 |
| North Carolina | 1 |
| Canada | 1 |
| Total | 165 |

# GENERAL INFORMATION.

## BUILDINGS AND GROUNDS.

**Swarthmore College** was founded by members of the religious Society of Friends, to provide the children of the Society and others with opportunities for higher education under guarded care. With this object in view, a property of two hundred and forty acres was secured ten miles from Philadelphia, on the Central Division of the Philadelphia, Wilmington, and Baltimore Railroad. It is accessible by trains from the Broad Street Station, nineteen times daily. About half the land is used for farming purposes, providing milk and vegetables for the College; the remainder is devoted to lawn and pleasure grounds. Crum Creek, which forms the western boundary of the property, affords facilities for boating, bathing, and skating. The portion of the grounds bordering the stream is of great picturesque beauty. The building site is high, thus securing perfect drainage and pure air, and commanding a fine view of the surrounding country for many miles.

**The Principal College Building** is a massive stone structure 348 feet long. It consists of a central building four stories high, containing public rooms, such as Lecture-rooms, Museum, Library, Reading-rooms, Parlors, Dining Hall, etc. Fire-proof compartments separate this building from the two wings. The latter are each three stories high. The ground floors are devoted to lecture and recitation rooms, the remaining floors in the East Wing contain the dormitories of the young women, and in the West Wing, those of the young men. The sexes mingle freely under proper care in the class-rooms, parlors, and dining hall. The instructors reside in the same building with the students, and the relations between them are such that there is comparative freedom from the dangers and temptations ordinarily incident to college life. The buildings are heated throughout by steam, lighted by gas, and thoroughly ventilated.

**The Science Hall** is constructed of stone, in the most durable manner, and was planned with special reference to the work of students in Engineering, Physics, and Chemistry. It has a frontage of 130 feet, and a depth of 64 feet. The basement contains the Wood-working Shop, the Blacksmith Shop, and the Foundry of the Engineering Department, and Store-rooms. On the first floor are the Machine Shop and Engineering Lecture Room, and the Chemical and Physical Laboratories, and on the second floor are the Draughting Rooms and the Chemical Lecture Room.

**The Astronomical Observatory** is especially arranged for purposes of instruction. The plan embraces a central building, supporting the dome, and two wings. There are three rooms: a *transit-room*, in which is placed an instrument of three inches aperture, also the mean-time clock, the chronograph and the barometer; a *pier-room*, which is at present utilized as a sidereal clock-room and work-room; and the *dome*, containing the equatorial of six inches aperture. In connection with this latter instrument there is a micrometer and a spectroscope. The transit and equatorial were constructed by Warner and Swasey, of Cleveland, and the spectroscope by Brashear, of Allegheny. The equipment is ample for class work.

Connected with the observatory is the Signal Service Station of the State Weather Bureau, fully provided with the necessary meteorological and other apparatus.

**Other Buildings** are a Meeting-House, the President's House, the West House (birthplace of Benjamin West, now used as a Professor's residence), the Farmer's House and commodious farm buildings, the Laundry and Bakery, and the Boiler House, containing the sectional boilers for heating and cooking purposes. All these buildings are constructed of stone.

## LIBRARIES AND READING ROOM.

**The Libraries** of the College collectively contain 13,225 bound volumes, as follows:

| | |
|---|---|
| The General Library | 9,411 |
| Literary Societies' Library | 2,749 |
| Friends' Historical Library | 1,075 |

Members of the senior class are permitted, under proper regulations, to consult the Philadelphia Library, containing 145,000 volumes, and the Mercantile Library, containing 150,000 volumes. The general Library is at all times accessible to the College students, and at stated times to the pupils of the Preparatory School. The Librarian will aid students in consulting the Library and in arranging courses of reading.

Friends' Historical Library, founded by the late Anson Lapham, of Skaneateles, N. Y., consists of Friends' books, photographs of representative Friends, and manuscripts relating to the Society and its history, and is, upon application to the Librarian, accessible to teachers, students, and members of the household.

This collection is stored in a fire-proof apartment, and it is hoped that Friends and others will deem it a secure place to deposit books and other material in their possession which may be of interest in connection with the history of the Society. Such contributions are solicited, and should be addressed to "Friends' Historical Library, Swarthmore, Pa."

**The Reading Room**, supplied with the leading literary and scientific journals, and the prominent newspapers of the principal cities, is open to students at all times except during the regular hours for study and recitations.

**Literary Societies** are maintained by the students. There are two for young men and one for young women. These hold regular meetings for the reading of essays, etc., and for practice in debate. Their Libraries, under their own management, contain over two thousand volumes, and are accessible to all of the College students.

A Scientific Society and a Natural History Club are also maintained by the students interested in science.

## THE MUSEUM.

**The Museum** of the College is strictly a teaching collection, and the specimens from its cases are in constant use in the lectures and laboratories in Natural History; it is growing steadily, but always in the direction of rendering more perfect the means of illustrating the different departments of natural history, and with no intention of making it a collection of curiosities or miscellaneous articles, however interesting they may be in their way.

It includes the following collections:

1. The **Joseph Leidy Collection of Minerals**, the result of thirty years' discriminative collecting by its founder, occupies four large double cases, and consists of exceedingly choice cabinet specimens of crystallized minerals, characteristic rocks and ores, and transparent and opaque models of the various systems of crystallization.

2. The **Collection of Comparative Osteology** consists of a large series of partial and complete skeletons, prepared at Prof. Henry Ward's Natural History Establishment in Rochester, N. Y., and illustrating the structure of the framework of backboned animals.

3. The **Wilcox and Farnum Collection of Birds** comprises four large double cases of stuffed specimens of native and foreign birds. Nearly all the species visiting this State are represented.

4. The **Frederick Kohl Ethnological Collection** consists of two cases of Indian implements, weapons, clothing, etc., mostly from Alaska.

5. The **C. F. Parker Collection of Shells** is made up of six large cases of choice typical land, fresh-water and marine shells. These specimens were all selected by the Curator from the extensive collection of the late C. F. Parker, and render further additions to this branch needless. The founder of this collection was for many years the Curator in charge of the Academy of Natural Sciences of Philadelphia.

6. The **Robert R. Corson Collection of Stalactites, Stalagmites and Helictites,** represent the celebrated Luray Caverns, and illustrate the limestone formations which render these caverns the second in magnificence in the world.

7. The **Eckfeldt Herbarium** consists of over two thousand plants, illustrating the flora of Pennsylvania.

In addition to the above, there is a large and constantly-increasing collection of stuffed and alcoholic specimens of vertebrates and invertebrates (including the U. S. Fish Commission Educational Collection), of dissected specimens for demonstration in the lectures on Physiology and Hygiene, glass and papier-maché models of invertebrates and of special points in vegetable and animal morphology, besides some three hundred classified diagrams and finely-colored charts illustrating every branch of natural history.

## THE GYMNASIUM.

**The Gymnasium** is supplied with a full set of apparatus for exercising according to the system of Dr. Sargent. The exercises are conducted in separate classes for the young men and young women, and are required of all.

*Students are requested to bring from home a physician's certificate, if there be any cause that would make it dangerous for them to take part in the exercises required.*

A large room in the main building also is set apart for the exercises of the young women.

The extensive and beautiful grounds connected with the College invite to out-door exercise, which is encouraged by the authorities. On the highest and driest part of the campus a space has been prepared for athletic games, with a track for running, a quarter of a mile in length, extending around it.

## GENERAL REGULATIONS.

**Religious Exercises.**—While care is taken to inculcate the doctrine that religion is a matter of practical daily life, and is not confined to the observance of set forms or the promulgation of religious tenets, the regular assembling for religious purposes is carefully observed. On First-day morning a religious meeting is held, attended by students, teachers, and members of the household, and occasionally by visiting Friends. The meeting is preceded by First-day school exercises, consisting of the recitation of passages of Scripture prepared by members of the different classes, and the reading of a portion of Scripture at the close. The daily exercises are opened by a general meeting for reading selected portions of Scripture, or other suitable books, and for imparting such moral lessons as circumstances seem to require, followed by a period of silence before entering upon the duties of the day.

**Leave of Absence** will not be granted without a *written* request from parents or guardians, which request should give reasons that may be satisfactory to the Faculty.

Students may be visited, on week-days, by parents or guardians, or by near relatives, or others approved by parents or guardians; but general visiting is discouraged. *Students must not be interrupted in*

*their studies or recitations at any time; nor must they be visited on First-day.*

All persons who are interested in education, and who are desirous of examining the methods of instruction and discipline at Swarthmore, will be welcomed at any time, and should, when convenient, communicate with the President upon the subject in advance.

**Outfit.**—Although no form of dress is prescribed for either sex, such simple attire as is appropriate to school-life is earnestly recommended. Ear-rings, bracelets, necklaces, and elaborately-trimmed dresses are prohibited.

Students should be supplied with six towels, six napkins, two clothes-bags, a wrapper, slippers, umbrella, and the requisite toilet articles. It is advised that the gymnastic dress be provided after arrival at the College, that it may meet the requirements of the teacher. Every article must be marked with the full name of the owner.

**The Use of Tobacco** *being strictly prohibited, those addicted to its use, unless prepared to renounce it entirely, should not apply for admission.*

**Commencement and Vacations.**—The College year begins on the second Third-day of Ninth month, and closes with Commencement-day, which occurs on the third Third-day of Sixth month.

Students are not admitted for a period less than the current College year, but when vacancies exist, may enter at any time during the year.

Besides the summer vacation, there will be a recess of about ten days at the close of the Twelfth month, and one of a week in the Fourth month. (See Calendar.)

Students are permitted to remain at the College, under care, during the recesses, but not during the summer vacation.

**The Household.**—In the organization of this institution unusual care has been extended to the personal comfort and the social interests of the students. This department is in charge of the Matron, with able assistants. She has also special oversight of the conduct and health of the young women and girls, and parents are desired to communicate freely with her in regard to the welfare of their daughters.

## PREPARATORY SCHOOLS.

Besides the College proper, the institution embraces a Preparatory School. The pupils of this school receive instruction from teachers em-

ployed especially for this purpose, and also from professors and instructors of the College.

This school receives those pupils who are not sufficiently advanced in their studies to enter the College. The point of advancement requisite for admission to the College will be found explained on page 25 of this catalogue.

*Parents are requested to examine the requirements for admission and, whenever it is practicable, to have their sons and daughters prepared to enter the Freshman Class.*

On page 27 will be found a list of schools which are authorized to recommend candidates for the Freshman Class without examination.

## EXPENSES.

**In the College** the cost of Board and Tuition is $450 per year, of which $250 is payable in advance, and $200 on the first of First month.

**In the Preparatory School** the charges are $350 per year, of which $200 is payable in advance, and the rest on the first of First month.

A deduction of $100 per year is made from the above charges to all students who are children of members of the religious Society of Friends.

**For Day Scholars** the price is $200 per year in the College and $150 per year in the Preparatory School, of which $100 is payable in advance, and the remainder on the first of First month. A deduction of $50 per year is made from these charges to all students who are children of members of the religious Society of Friends. The day scholars dine with the resident students.

**Books are furnished** for the use of all students without expense, but they buy their own stationery, drawing implements, and certain tools and materials used in the workshops. Students taking laboratory courses make a deposit of $10 at the beginning of the course, to cover the expense of the material used. The unexpended balance is returned at the end of the course.

**In case of Sickness,** no extra charge is made unless a physician is employed.

Boys are allowed the washing of one dozen plain pieces weekly; and girls the washing of sixteen plain pieces weekly. Extra washing is paid for at fixed rates.

The price being made as low as experience shows to be compatible with prudence, while many of our expenses are annual in their character, and teachers

and other officers at fixed yearly salaries must be engaged in proportion to the number of students entered, we cannot, in case of withdrawal, return the full proportionate amount paid without loss. When the connection of a student with the institution shall terminate by sickness, or by any other cause approved by the Faculty, before the end of the period for which payment has been made, the student may have the privilege of sending an approved substitute for the unexpired term, or may apply, in writing, to the Treasurer, and a return will be made of two-thirds of the amount prepaid from the date of said application or written notice that the place is vacated.

The above prices may be depended upon as covering all necessary expenses, as there are no other extra charges.

## PAYMENTS.

Payments are to be made by check or draft to the order of

ROBERT BIDDLE, Treasurer,

No. 511 Commerce Street, Philadelphia.

# THE COLLEGE.

## INTRODUCTORY.

The studies required for a degree extend over four years. The requirements for admission are intended to be such as Friends' schools generally can meet. Owing to the enforcement of regular hours for study, and the absence of all opportunity for dissipation, the amount accomplished in four years is large, and is believed to afford a sufficient preparation in classics, science, and general culture for the ordinary avocations of life, for the study of any of the learned professions, or for the pursuit of special courses in the higher universities.

## TIME AND CONDITIONS OF ADMISSIONS.

To secure places, application for admission should be made as early as possible by letter to the President.

All applicants must submit satisfactory testimonials of good character from their last teachers, and students coming from another college must present certificates of honorable dismissal.

The examinations for admission may be taken either in the Summer at the close of the College year, or in the Fall. The times are as follows for the year 1889:

### SUMMER EXAMINATIONS.

| | | | | | | |
|---|---|---|---|---|---|---|
| Sixth-day, | Sixth | Month, | 14th, | at | 2 P.M. | . Mathematics. |
| " | " | " | " | " | 3.30 P.M. | . English. |
| Seventh-day, | " | | 15th, | " | 8.15 A.M. | . History. |
| " | " | | " | " | 9.15 A.M. | . Geography. |
| " | " | | " | " | 10.15 A.M. | . Latin, German or French. |
| " | " | | " | " | 2 P.M. | . Greek. |

Arrangement can be made for board at the College during the above examinations.

## FALL EXAMINATIONS.

Candidates should present themselves at the College on the afternoon of Third-day, Ninth month 10th, 1889.

The examinations will occur as follows:

| | | | | | |
|---|---|---|---|---|---|
| Fourth-day, | Ninth | Month, | 11th, | 8.15 A.M. | Mathematics. |
| " | " | " | " | 9.15 A.M. | English. |
| " | " | " | " | 10.15 A.M. | History and Geography. |
| " | " | " | " | 2 P.M. | Latin, German or French. |
| " | " | " | " | 3 P.M. | Greek. |

N. B.—Students are also admitted at any time during the year, and are charged for the unexpired time until the close of the year.

## REQUIREMENTS FOR ADMISSION.

Candidates for admission to the Freshman Class will be examined in the following subjects:

1. MATHEMATICS.—*Arithmetic.*—Fundamental Rules, Fractions (common and decimal), Denominate Numbers, Percentage and its applications, Proportion, and the Metric System.

*Algebra.*—Through Equations of the second degree of one unknown quantity.

*Geometry.*—The whole of Plane Geometry.

2. ENGLISH.—The candidate will be asked to write a few pages upon some assigned subject, or from dictation. This exercise will be examined with reference to Grammar, Spelling, Paragraphing, Punctuation, and the use of Capitals. An examination will also be given in the principles of the grammar.

3. HISTORY.—A general outline of the History of the United States and of England, with the principal dates; the principal facts and dates in Grecian History. In this connection there will be an examination in Ancient Geography, particularly that of Italy, Greece, and Asia Minor.

4. GEOGRAPHY.—The general facts of Physical Geography, Descriptive and Political Geography, especially of the United States and Europe.

*In addition to the above, the candidate will be examined in one of the following subjects as he may elect:*

5. LATIN.—Cæsar, Gallic War, four books; Virgil's Æneid, six books; Allen's Latin Composition.

6. FRENCH.—The candidate should be familiar with the Grammar, especially with the formation and use of verbs. He should be able to read easy French at sight, and to translate simple English sentences into French.

7. GERMAN.—The preparation in German should occupy one year. The candidate should be able to read easy German at sight, and to translate simple English sentences into correct German.

Candidates for the *Classical Section* must pass the above examination in *Latin*.

*Greek* is not required for admission, but students who have been prepared in Greek may continue in that language with students in the higher College classes.

Candidates for the *Scientific Section*, who have had no opportunity to prepare in Latin, French, or German, will not be rejected on account of such deficiency, if they are otherwise qualified. An opportunity will be offered to make up the deficiency after admission.

Preparation in Free-Hand Drawing is recommended for all students.

The attention of Committees and Principals of Schools preparing students for the College, is called to the course of study in the Swarthmore Preparatory School, which is deemed a suitable preparation.

For Advanced Standing.—Candidates must be further examined in the studies already pursued by the class for which they present themselves; but in the case of such students real equivalents will be accepted for any of the studies gone over by the class.

## ADMISSION WITHOUT EXAMINATION.

I. Those candidates for the Freshman Class who are prepared in the following schools *will not be examined*, but will be admitted to that class or to any class in the Preparatory School on certificates signed by the Principals of the schools.

| | |
|---|---|
| Friends' Central School | Philadelphia, Pa. |
| Friends' Seminary | New York, N. Y. |
| Friends' High School | Baltimore, Md. |
| Woodstown Academy | Woodstown, N. J. |
| Friends' School | Wilmington, Del. |
| Friends' High School | West Chester, Pa. |
| Friends' High School | Moorestown, N. J. |
| Buckingham Friends' School | Lahaska, Pa. |
| Friends' Academy | Locust Valley, L. I. |
| Friends' Select School | Washington, D. C. |
| Sherwood School | Sandy Spring, Md. |
| Friends' School | Kennett Square, Pa. |

Pupils from these schools, intending to enter the College, should apply by letter for places as soon as convenient after the completion of their preparation. They should present themselves at the College on Fourth-day, Ninth month 11th, 1889.

Principals of other schools, who wish to have students admitted on their recommendation, should correspond with the President concerning each case.

II. A limited number of teachers and other persons of fair education and over twenty-one years of age, who may wish to improve themselves in particular studies, will be received without examination, and allowed to elect, in any of the regular classes, such work as they can pursue to advantage. They should in all cases correspond with the President in advance.

## COURSES OF INSTRUCTION.

*(Alphabetically Arranged.)*

N. B.—For required and elective studies, and the number of exercises per week in each, see pages 46–53.

### CHEMISTRY.

The course of instruction in this subject extends over a period of three years, and aims to impart a thorough understanding of the most essential facts and principles of the science, while special attention is given to the cultivation of systematic habits of manipulation, so that, besides possessing value as part of a liberal education, it forms a foundation for such pursuits in life as require this knowledge.

Those who may desire to continue their work beyond the limits of the regular course will have suitable work assigned them, and will find every facility for carrying it on.

**The Chemical Laboratory** occupies rooms in Science Hall. It includes a room for work in general Chemistry and Qualitative Analysis, one for Quantitative Analysis, and a basement room for Assaying and Metallurgy. Near to these are store-rooms, a balance-room and a lecture-room. The Laboratory tables are covered with glazed tiles; and fume-closets, suction for filtration, water and gas are provided. The Lecture-room, with a seating capacity of one hundred, is furnished with water, gas, fume-closets, and abundant apparatus for lecture purposes, including a nearly complete set of the apparatus devised by Dr. Hofmann, of Berlin. For lecture illustration there is an excellent collection of the metals and their salts, and a cabinet of minerals (deposited by Hugh Foulke); in addition to these, there has recently arrived from C. F. Kahlbaum, of Berlin, a complete set of typical preparations for use in the course in Organic Chemistry.

CHEMICAL LIBRARY.—In all cases students are encouraged in the habit of consulting for themselves the best authorities; and in a room near to the laboratory there will be found a number of standard works on chemistry; among them may be mentioned Watt's "Dictionary of Chemistry;" Roscoe and Schorlemmer's "Treatise on Chemistry," besides numerous other works on technical and analytical Chemistry.

TEXT-BOOKS.—As the student advances in the course the following text-books are supplied: "Elementary Chemistry," Remsen; "Introduction to Qualitative Analysis," Beilstein; "Introduction to the Study of the Compounds of Carbon," Remsen; "Quantitative Chemical Analysis," Fresenius: "Theoretical Chemistry," Remsen.

1. *Freshman Class.*—LECTURES (EXPERIMENTAL).—*a.* General Elementary Chemistry (non-metals and metals), with examinations.

*b.* LABORATORY-WORK.—Special exercises on topics previously discussed in the lectures.

2. *Sophomore Class.*—LECTURES.—*a.* Analytical Chemistry, followed by the "Chemistry of the Compounds of Carbon."

*b.* LABORATORY-WORK.—Qualitative followed by Quantitative Chemical Analysis.

3. *Junior Class.*—LECTURES.—*a.* Modern Chemical Theories.

*b.* LABORATORY-WORK.—Quantitative Analysis, followed by a few exercises in important typical organic transformations.

## DRAWING AND PAINTING.

A course of Free-hand Drawing and Painting is open to all. Aside from its intrinsic value as a means of culture, it is a very important adjunct to the other courses, especially to those in science.

It consists of Object Drawing or Painting, from still life, flowers, etc. Students who have acquired sufficient skill may join a class for sketching from nature one afternoon during the week in Spring and Autumn.

## ENGINEERING AND MECHANIC ARTS.

This department is intended to give a good preparation to those students who are expecting to become either Civil or Mechanical Engineers. The studies and exercises are so arranged that the graduates will be prepared to become immediately useful in the office, works, or

field, in subordinate positions, and, after a fair amount of such practice, to design and take charge of important works.

The location of the College is most favorable for residence and study, combining the quiet of the country with ready access to Philadelphia and the many important manufacturing cities in its vicinity, and permitting frequent visits to industrial and engineering works of every kind.

The Department is well provided with the necessary field instruments, Transits, Levels, Plane-Table, etc., and each student is made familiar with their use and management by practical work in the field and draughting-room, carefully planned to illustrate the actual practice of the engineer.

Included in the work of this department is a course in the Mechanic Arts, in which regular and systematic instruction is given by skilled instructors in the use of tools and machinery, and in processes. Patterns are made by the students, from their own designs and drawings, of machines or parts of machines, and the castings are made, properly fitted together, and finished according to the drawings.

**The Draughting Rooms** are lighted from the north, are furnished with adjustable tables, models, etc., are well ventilated and warmed, and are open for work during the greater part of the day.

**The Engineering Laboratory** contains an Olsen's testing machine, arranged for tensile, compressive and transverse tests, a steam engine director, and other valuable appliances. It includes several shops, in which the students become familiar with the nature and properties of the materials of construction (iron, wood, brass, etc.) employed by the engineer, and with the processes of working them into the desired forms for their intended uses. They consist of

*The Machine Shop*, containing an excellent and complete assortment of tools, including 4 screw-cutting engine lathes, 3 speed-lathes (simple and back-geared), an iron planer, a complete universal milling machine, a set of milling cutters adapted for general purposes and for making other cutters, a shaper, a twist-drill grinder, 2 upright drills, an emery grinder, a mill grinder, a grindstone, 14 vises (plain and swivel), 14 lathe chucks (combination, independent, scroll, and drill), a milling machine chuck, a rotary planer chuck, planer centres, a set of Betts's standard gauges, surface plates (Brown & Sharpe), 3 sets of twist drills, reamers, mandrels, screw-plates, taps and dies, lathe centre grinder, a complete set of steam-fitters' tools with pipe vise, ratchet drill,

etc., together with the many necessary small tools, hammers, chisels, files, etc. Additions are constantly being made to this collection, as they are needed, either by manufacture in the shops or by purchase. Power is furnished by a steam engine and boiler, the former fitted with an improved indicator, and the latter with the necessary attachments for determining its efficiency, etc.

*The Wood-Working Shops*, containing 20 benches with vises, and 20 sets of wood-working tools, a grindstone and wood-turning lathes.

*The Smith-Shop*, containing 7 forges, anvils, and sets of blacksmith tools, bench, and vise; and

*The Foundry*, with its brass furnace and other equipments.

The details of the course vary somewhat from year to year; but, in general, are represented by the following arrangement of the studies:

1. Freshman Class.—*Machine Shop Practice:* Vise work, chipping and filing to line, scraping, fitting, tapping, reaming, hand-turning in brass and iron.

*Drawing:* Special geometric problems, working drawings for the shop exercises, orthographic projections, shadows, brush work and tinting, machine drawing from copy and from measurements, gears, eccentrics, cams, pulleys, belting, etc.

*Engineering:* Lectures on the use of tools, on the properties of materials, etc.

2. Sophomore Class.—*Engineering:* Analytical Mechanics of Solids and Fluids; Descriptive Geometry, including Shades, Shadows, and Perspective; and the careful construction of the more important problems; Land Surveying, with Field Practice and Map Drawing.

*Machine-Shop Practice.*—Lathe work, turning, boring, screw-cutting, drilling, planing, milling, grinding, polishing, etc., construction of a project.

*Drawing.*—Working drawings for the shop exercises, sketches, drawings and blue prints for special work and projects, elements of machines, shadows and intersections, finished drawings.

3. Junior Class.—*Before entering upon the work of this year the student must have completed Course 3 in Mathematics.*

*Engineering.*—Theory and Practice of Road Surveying and Engineering.

*Geodesy.*—Theory; Adjustment and Use of Engineering Field Instruments; Farm Surveying; Leveling; Topographical, Triangular, and Hydrographical Surveying.

*Applied Mechanics.*—Friction and other resistances; Stress and Strength of Materials.

*Drawing and Mechanism.*—Topographical, Structure, and Machine Drawing; Principles of Mechanism; Visits to and Sketches of Special Machinery and Structures.

*Practical Exercises* in the Field in the Fall and Spring months, and in general Laboratory practice, including the testing of metals, and building materials, the setting up, testing, and management of steam-engines, boilers, and machinery, throughout the year; with occasional visits to mechanical establishments, and to important engineering works in or near Philadelphia.

4. Senior Class.—*Before entering upon the work of this year, the student must have completed Course 4 in Mathematics.*

*Engineering.*—Theory and Practice of Road Surveying and Engineering, continued; Building Materials; Stability of Structures; Foundations and Superstructures; Bridge Construction.

*Applied Mechanics.*—Practical Hydraulics; Practical Pneumatics; General Theory of Machines; Theory of Prime Movers, Steam-Engines, Turbines, etc.; Measurement of Power.

*Mechanism.*—Principles of Mechanism, of Machine Design, of the Transmission of Power; Construction and Use of Tools.

*Drawing.*—Stone-Cutting Problems; Topographical, Structure and Machine Drawing; Plans, Profiles, and Sections of Road Surveys; Working Drawings.

*Practical Exercises.*—As in Junior year, continued; Tests of Building Materials; Graduating Thesis.

## ENGLISH LITERATURE.

The course in English Literature extends through four years, instruction being given by recitations and lectures. During this time the most prominent authors, from Chaucer to the present day, are made subjects of careful study. The particular feature of the course is the critical reading, in each year, of various masterpieces of literature, such as plays of Shakespeare, Milton's Paradise Lost, Pope's Poems, Tennyson's Idyls of the King, etc. Peculiarities of style and language are considered, allusions are looked up, and every effort made for a thorough comprehension of the work in hand. The author's life is studied in its relation to the history of the time, and his works are compared

with those of his contemporaries. By this course it is expected that the student will be enabled, from his own observation, to form an intelligent estimate of the style and merits of the great authors of English Literature.

## FRENCH.

Preparatory Class.—Beginning French. Magill's Grammar and Reader; writing French Exercises.

1. Freshman Class, *First Semester.*—Fenelon's Télémaque; Magill's Grammar; varied Selections from modern French writers.

2. Sophomore Class, *Second Semester.*—Magill's Prose and Poetry; Magill's Grammar; varied selections in prose and poetry.

3. Junior Class, *Second Semester.*—Bôcher's College Series of Plays; Dumas's Napoleon, etc.; Magill's Grammar.

4. Senior Class, *First Semester.*—Corneille's Cid; Racine's Athalie; Molière's Misanthrope; Les Précieuses Ridicules, etc.; Magill's Grammar.

## GERMAN.

1. Freshman Class, *Second Semester.*—Beginning German. The Grammar, with constant practice in writing exercises; reading German ballads and easy prose; conversational exercises.

2. Sophomore Class, *First Semester.*—Stories—Aus dem Leben eines Taugenichts; German Plays—Eigensinn, Einer muss heirathen, etc.; exercises in writing German; conversation.

3. Junior Class, *First Semester.*—Schiller's Wilhelm Tell, Maria Stuart, etc.; dictation; writing; conversation.

4. Senior Class, *Second Semester.*—Goethe or Lessing; Schiller's Prose; studies in the History of German Literature; conversation and writing.

## GREEK.

Greek is not required for admission to the College, but a course of three years is required for graduation with the degree of A. B., as per scheme below. Those who offer Greek on entering the College will go on in advanced classes. Those who have not previously studied the language will be required to complete the following courses:

Sophomore Class.—Goodwin's Grammar; Xenophon's Anabasis or Memorabilia (3 books).

Junior Class.—Plato's Apology of Socrates, Fernald's Greek Historians (selections), Greek Composition.

Senior Class.—Homer's Iliad or Odyssey (6 books), Sophocles (Antigone), Euripides (Hecuba), History of Greek Literature (Lectures).

## HISTORY.

The instruction in history consists of lectures, recitations, oral and written reports by the students on various assigned topics that require the use of several standard authorities, map-drawing, and the preparation of diagrams to illustrate statistics. To encourage the study of history by means of biography, the preparation of biographical sketches of leading historical characters is required. All who intend to pursue the courses in history should be thoroughly familiar with the outlines of the history of the United States, England, and Greece, before entering the Freshman Class.

The courses offered are as follows:

1. Freshman Class.—Roman history to the close of the fifth century A. D. Special attention is given to the religious and political institutions and the system of Roman administration. A review of the character of the Spartan and Athenian Constitutions is included in the course.

The text-books consist of the three Primers: Creighton's History of Rome, Wilkins's Roman Antiquities, and Tighe's Development of the Roman Constitution. Much additional reading in larger histories is required.

2. Sophomore Class.—The character and institutions of Primitive Christianity; Teutonic Migrations; Church and State in the Middle Ages; the character and influence of the Renaissance; the eras of the Reformation and Thirty-Years War; Text-book,—Myers's Outlines of Mediæval and Modern History; reading in other authorities, such as Bryce, Milman, Hatch, Gibbon, Motley, Fisher, Symonds, Gardner, etc.

Before taking this course students must have taken the course in Roman history.

3. Junior Class.—*First Semester.*—English constitutional history and a study of the present form of government. Text-book: Green's

Short History of the English People. Authorities for topical study: Stubbs, Hallam, May, Bagehot, and the English Citizen Series.

*Second Semester.*—American political and constitutional history. The political and religious characteristics of the colonial governments are first studied, then the constitutional phases of the revolutionary period, the formation and adoption of the present constitution, the nature of the constitution, the political and constitutional history to the close of the reconstruction period, and a study of the present form of the national government. Authorities: Johnston, Frothingham, Bancroft, Curtis, Federalist, Von Holst, Schouler, American Statesmen Series, Original Documents, etc.

## LATIN.

1. Freshman Class.—Cicero, orations; Sallust, Catiline.
2. Sophomore Class.—Horace.
3. Junior Class.—Cicero, De Senectute; Plautus; Terence.
4. Senior Class.—Lucretius, Livy, Juvenal, Tacitus, Latin Hymns.

## LOGIC.

Senior Class.—*Logic.*—One exercise a week. (Jevons).

## MATHEMATICS.

1. Freshman Class.—Wells's Algebra, through Quadratic Equations; Davies's Legendre's Geometry, Review, and Book VI.; Chauvenet's Plane Trigonometry.
2. Sophomore Class.—Davies's Legendre's Geometry, Books VII.–IX.; Wells's Higher Algebra; Todhunter's Conic Sections; Descriptive Astronomy.
3. Junior Class.—Williamson's Differential and Integral Calculus; Chauvenet's Spherical Trigonometry; Determinants.
4. Senior Class.—Chauvenet's Spherical and Practical Astronomy.

## NATURAL HISTORY.

Under this head are included the studies of Zoology, Botany, Physiology, Geology and Mineralogy.

The subjects are so arranged, throughout the four College years, that they form a graded course, admirably adapted to the purpose of

training young men and young women in the right methods of thinking about and interpreting the problems continually presented to them by natural objects. While lectures and text-books are used to inspire the members of the class to study, these means are supplemented, in so far as possible, by drill in the laboratory and field; by which the students become accustomed to see for themselves, to gather facts, to study and arrange them, and to deduce the principles involved. The course is arranged as follows:

1. Zoology and Botany.—(*a*) *Zoology.*—The course in Zoology consists of two lectures a week on the various groups of animals, their classification, anatomy, development, distribution, habits and economic relations; it extends over two years.

Vertebrates and invertebrates are considered in alternate years, thus carrying each class over the entire field. The lectures are illustrated by means of a large collection of colored charts and diagrams, and by specimens from the very complete set of skeletons, stuffed and preserved animals, shells and fossils.

(*b*) *Elementary Botany.*—Lectures, recitations, and practical laboratory work during a portion of the Freshman year, autumn and spring. The time is taken from the Freshman course in Zoology, the lectures of which are discontinued for the time. It is intended in this course only to teach the more prominent points in vegetal morphology, to accustom the student to accurate observation, and to the use of the analytical key for the determination of plants.

(*c*) *Advanced Botany.*—This course consists of practical laboratory work accompanied by explanatory lectures. The time, like that for the elementary botany of the Freshmen, is taken from the Sophomore course in Zoology. It is intended in this course to furnish students with a working knowledge of those kinds and parts of plants commonly neglected. Fungi, Algæ, Lichens, Mosses, Liverworts, Ferns, Grasses, Sedges, etc., will be studied in turn, in so far as material and time will allow, and to an extent sufficient to enable the student to appreciate their relations and to continue the subject by himself. A conservatory, convenient to the work-tables, will furnish material for study, which will be carried on by means of single and compound microscopes of the latest and most approved construction, and apparatus for the cutting of sections and preparation of specimens. Lectures on the geographical distribution of plants, the life histories of special cultivated plants, and on applied botany, will be delivered at intervals throughout the year

A set of reference works on structural and cryptogamic botany will be found in the laboratory, and is at the disposal of the students under the same conditions as the works on Biology.

For the purpose of instilling a love of plants and encouraging out-door exercise, a garden has been established, in which students wishing it may have a plot of ground assigned to them. Here they may plant flowering plants and attend to them under the supervision of the Instructor in Botany.

2. Physiology and Hygiene.—A course upon these subjects is prescribed for the young men of the Freshman Class, and a separate but similar course for the young women in that class. The time is taken from the Freshman course in Zoology. *Attendance required of all students in the class.*

3. General Biology.—This course in life-science is intended to lead students to an intelligent understanding of the phenomena of their own existence and of the living things about them. Besides its value an an element of general culture, the engendering of habits of close observation, neat-handedness, and quick perception, it will be found of special value to such as contemplate taking up the study of medicine after completing their College course. The course extends through two years, and consists of practical laboratory work accompanied by explanatory lectures.

The Biological Laboratory is well lighted by windows on the north. It is heated by steam and supplied with all the appliances, microscopical and otherwise, needed for the work carried on. A conservatory and numerous small aquaria furnish a constant supply of material for study, both in the course in Biology and in advanced Botany.

1. Junior Class.—Manipulation of microscope; Differences between living and lifeless bodies; differences between animals and plants; elementary structure of living bodies; elementary chemistry of animals and plants; physiological functions of animals and plants; the biology of some particular plants; the biology of some particular animals.

2. Senior Class.—Practical systematic work in the Museum, studies in comparative Osteology and the dissection of types of back-boned animals, laboratory exercises on the embryological development of the chick, and in Mammalian histology.

Students will find in the general library a large number of valuable and interesting works pertaining more or less directly to Biology.

In addition to these, there will be found in the Biological Laboratory books bearing directly on the subjects studied therein and necessary each day for the proper illustration and elucidation of the topic under consideration. These books are always at the disposal of the students, but must not be removed from the laboratory during working periods.

4. Mineralogy and Geology.—Once a week throughout the year. Informal discussions of geological problems, and how to treat them, accompany the practical study of hand specimens in the laboratory. This is followed by tramps through neighboring quarries, railroad cuts, etc., hammer in hand, under the personal supervision of the Instructor. The course is moreover illustrated by numerous charts and diagrams, and by specimens from the excellent collection of typical rocks, minerals, and fossils. Winchell's "Geological Studies" is used, and supplemented by a very complete series of geological maps and works of reference.

5. Mineralogy.—Lectures and recitations once a week in crystallography and descriptive mineralogy, with two periods per week of practice in determining minerals by their physical properties, and by means of the blow-pipe ; the whole counting as two periods. Students in Mineralogy will have access to the "Leidy Collection of Minerals."

## PHILOSOPHY.

Senior Class.—Mental Philosophy.—*First Semester.*—Porter's Elements of Intellectual Science is used as a Text-Book, and the subject is presented historically, with outlines of the different schools of Philosophy.

Moral Philosophy.—*Second Semester.*—A system of morals is taught, practical rather than theoretical, setting forth man's duties, and the application thereto of the moral law. The text-book used is Janet's Elements of Morals.

Lectures, Discussions, Essays, Examinations.

## PHONOGRAPHY.

A course of lessons in Phonography; Corresponding and Reporting style. Graham's works are used as text-books.

## PHYSICAL CULTURE.

All students undergo an examination at the beginning of each year, and each individual is required to take such a course in Physical

Culture as is prescribed by the Director. Subsequent examinations show the improvement made in each case. The Gymnasium is supplied with a complete set of the Sargent apparatus.

## PHYSICS.

**The Physical Laboratory** is already provided with apparatus for determinations in the mechanics of solids and fluids, in heat, sound, light, electricity and magnetism; as also with a large amount for lecture experiments. Most of this has been selected with care from the best American and foreign makers, but some is of home manufacture, and the co-operation of the Engineering Department, and the increasing skill of our students, enable us now to make each year a larger proportion for regular use in the laboratory. It is our aim to afford students continued opportunities for instruction in the principles of construction of ordinary and special apparatus. Power for running dynamos and for other purposes is near at hand. The instruction begins in the Sophomore year, and extends through the course as follows:

Sophomore Class.—General Physics.—Using Gage's Physics for a text-book. This course consists of Lectures, Recitations, and a proper amount of Laboratory practice.

Junior Class.—Courses in Thermodynamics and Light. The course in Light is intended to afford special preparation for the course in Practical Astronomy of the Senior year.

Senior Class.—Applied Electricity.—This is an elective course for students in Science and in Engineering.

## POLITICAL SCIENCE.

Senior Class.—Political Economy.—*First Semester.*—The elements of political economy during the first part of the term, with Walker's Principles of Political Economy as a text-book. The course also includes a sketch of the history of political economy and the consideration of various social and industrial questions. Topics are assigned requiring reading in Mill, Thompson, Roscher, List, Marshall, Laveleye, etc.

*Second Semester.*—Elements of International Law, with especial attention to the important subjects of Peace and Arbitration.

## READING AND SPEAKING.

This course extends over four years. It consists of training in posture, respiration, articulation, enunciation, and especially in logical analysis. Care is taken that the student should learn to comprehend and appreciate the thought, and to give it natural and effective expression. This requires a careful study of the authors chosen, so that the course becomes to some extent one in English Literature. Only selections of acknowledged excellence are assigned, and at the end of the course the student will have studied critically and becomes familiar with a considerable number of them.

In the Freshman and Sophomore Classes shorter selections are made from a number of authors; in the Junior and Senior Classes attention is concentrated on a few of the great masterpieces of our literature, which are studied entire.

## RHETORIC AND COMPOSITION.

Freshman Class.—*Second Semester.*—Diction, Structure of Sentences and Paragraphs, Analysis of Subjects, Kinds of Prose Composition, Style, Figures of Speech, and Versification.

Themes once in four weeks in Narrative and Descriptive styles of composition.

Sophomore Class.—Miscellaneous Themes; translations from Latin, Greek, English Prose and Poetry. Once in four weeks.

Junior Class.—Lectures on Oral and Written Discourse. Themes once in five weeks, embracing Criticisms, Argumentative Disputes, and Orations.

Senior Class.—Practice in Daily Themes; Reviews or Themes suggested by the life, characteristics, and writings of standard prose writers; Philosophical and Scientific Essays. Once in five weeks.

## TEACHING.

Science of Education.—This is a two-years course. The first year is devoted to the history of educational theories and systems, the class using Compayré's History of Pedagogy. Topics are assigned to the students for special study. In addition to the recitations, lectures are given on various subjects in the course.

During the second year special educational topics concerning our own country are taken up, such as the origin, growth, and needs of the public schools; private schools; normal schools; school laws; the history of collegiate education; state aid to education; education of defectives; our educational reformers and their writings; the qualifications of a teacher; the literature of education.

In connection with the historical and theoretical study of Education, weekly exercises are given in the *practical* work of the teacher, the class of young teachers themselves being used as a practice class.

# GENERAL REMARKS ON THE COURSES OF STUDY.

In arranging the courses of study, while recognizing the fact that the domain of human knowledge is so vast that he who would succeed best must confine his attention chiefly to some chosen field, we have endeavored not to lose sight of the equally important fact that those are best equipped for work in any particular department who have the most extended view of the realm of learning as a whole.

To secure in a measure both these results, minor courses in many of the subjects of the curriculum are required of all; while the more extended courses in each subject are taken only by those whose taste and inclination lie in that particular direction.

In pursuing this policy for several years, we have developed four distinct lines of study. In each of them are required those subjects which are essential to the logical and natural development of the course. The courses are as follows:

1. The Course in Arts, leading to the degree of Bachelor of Arts. The characteristic feature of this course is the study of Classical Antiquity, including the language and literature of the Greeks and Romans, with their art, philosophy, religion, and political and social history. Combined with this are courses in Modern Languages, Mathematics, and Science, with some elective subjects.

While this course affords that broad culture which should be the foundation of any subsequent career, it may be made to afford special preparation for Law or Journalism by including electives in History and Political Economy, or it may be shaped in the direction of Medicine by choosing electives in Biology and Chemistry.

2. The Course in Letters, leading to the degree of Bachelor of Letters. This course is arranged to provide a liberal education for those who do not wish to pursue the study of the ancient languages, nor to take all the science required in the Science Course. Its leading features are a liberal amount of English, French, and German, and of History and Political Science. It includes the amount of Mathematics usually

prescribed in a college course, with a fair amount of Science, and some elective subjects, including Latin.

3. The Course in Science, leading to the degree of Bachelor of Science. The characteristic feature of this course is more extended instruction in Science than in the preceding courses, together with a fair amount of Mathematics and Modern Language study, including English. The instruction in Physics, Chemistry, and Biology is of a twofold character; first, systematic treatment in experimental lectures; secondly, practical work in the laboratories. Thus the student acquires a familiarity, not only with the more important facts and fundamental principles of those sciences, but also with the correct methods of work, so that his course may form a foundation for subsequent higher work in any department of science.

4. The Course in Engineering, leading to the degree of Bachelor of Science in Engineering. This course offers, in its various studies and exercises, a training which is believed to be well adapted to the needs of Civil and of Mechanical Engineers, as well as of the large class who are to be concerned with the material interests of the country, with manufacturing, with industrial pursuits, or with any of the many other occupations allied to Engineering. It embraces liberal and technical instruction in the mathematical, physical, and graphical sciences, and their applications, in practical field engineering, in the arts of design and construction, and in the use of tools, materials, and machinery, and in processes.

ARRANGEMENT OF THE COURSES OF STUDY

IN THE

FOUR DEPARTMENTS OF

# ARTS, LETTERS, SCIENCE AND ENGINEERING.

WITH A

SEPARATE CONSPECTUS FOR EACH DEPARTMENT.

# STUDIES OF THE COURSE IN ARTS.

Elective studies must be so chosen as not to interfere with those which are prescribed.

## FRESHMAN YEAR.

First Semester.—*Prescribed.*—Latin, 4; French, 4; Mathematics, 4; History, 4; Natural History, 2. Total, 18 Periods.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2; Elocution, 2.

Second Semester.—*Prescribed.*—Latin, 4; German, 4; Mathematics, 4; Rhetoric, 2; Elocution, 2; Natural History, 2. Total, 18 Periods.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2.

## SOPHOMORE YEAR.

First Semester.—*Prescribed.*—Greek, 4; Latin, 4; German, 4; Mathematics, 4; Physics, 2; Natural History, 2. Total, 20 Periods.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2; Elocution, 2.

Second Semester.—*Prescribed.*—Greek, 4; Latin, 4; French, 4; Physics, 2; Natural History, 2; Electives, 4. Total, 20 Periods.

*Electives.*—History, 4; English, 4; Descriptive Astronomy, 2; Pedagogics, 2; Elocution, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

## JUNIOR YEAR.

First Semester.—*Prescribed.*—Greek, 4; Latin, 4; Chemistry, 4; Electives, 8. Total, 20 Periods.

*Electives.*—German, 4; History, 4; English, 4; Physics, 4; Biology, 6=4; Pedagogics, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Elocution, 2.

Second Semester.—*Prescribed.*—Greek, 4; Latin, 4; History, 4; Electives, 8. Total, 20 Periods.

*Electives.*—French, 4; English, 4; Chemistry, 4; Physics, 4; Biology, 6=4; Pedagogics, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Elocution, 2.

## SENIOR YEAR.

First Semester.—*Prescribed.*—Greek, 4; Mental and Moral Philosophy, 4; Political Science, 4; Logic, 1; Geology, 1; Elocution, 2; Electives, 4. Total, 20 Periods.

*Electives.*—Latin, 4; Chemistry, 4; English, 4; French, 4; Biology, 6=4; Pedagogics, 2; Mineralogy, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—Greek, 4; Mental and Moral Philosophy, 4; Logic, 1; Geology, 1; Elocution, 2; Electives, 8. Total, 20 Periods.

*Electives.*—Latin, 4; Chemistry, 4; English, 4; German, 4; Political Science, 4; Biology, 6=4; Pedagogics, 2; Mineralogy, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

Physical Culture is required of all.

Essays are required throughout the course.

# Conspectus of Studies of the Course in Arts.

| | Latin, 4. | French, 4. | German, 4. | Mathematics, 4. | Natural History, 2. | Rhetoric, 2. | Elocution, 2. | History, 4. | Greek, 4. | Physics, 2. | Chemistry, 4. | Mental and Moral Philosophy, 4. | Political Science, 4. | Logic, 1. | Geology, 1. | Mineralogy, 2. | Physics, 4. | English, 4. | Descriptive Astronomy, 2. | Pedagogics, 2. | Biology, 6—4. | Phonography, 2. | Drawing and Painting, 2. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freshman Year. 1st Semester . | Pre. | Pre. | | Pre. | Pre. | Essays required throughout the course. | Ext. | Pre. | | | | | | | | | | | | Ext. | | Ext. | Ext. |
| Freshman Year. 2d Semester . | Pre. | | Pre. | Pre. | Pre. | | Pre. | | | | | | | | | | | | | Ext. | | Ext. | Ext. |
| Sophomore Year. 1st Semester . | Pre. | | Pre. | Pre. | Pre. | | Ext. | | Pre. | Pre. | | | | | | | | | | Ext. | | Ext. | Ext. |
| Sophomore Year. 2d Semester . | Pre. | Pre. | | | Pre. | | Elec | Elec | Pre. | Pre. | | | | | | | | Elec | Elec | Elec | | Ext. | Ext. |
| Junior Year. 1st Semester . | Pre. | | Elec | | | | Ext. | Elec | Pre. | | Pre. | | | | | | Elec | Elec | | Elec | Elec | Ext. | Ext. |
| Junior Year. 2d Semester . | Pre. | Elec | | | | | Ext. | Pre. | Pre. | | Elec | | | | | | Elec | Elec | | Elec | Elec | Ext. | Ext. |
| Senior Year. 1st Semester . | Elec | Elec | | | | | Pre. | | Pre. | | Elec | Pre. | Pre. | Pre. | Pre. | Elec | | Elec | | Elec | Elec | Ext. | Ext. |
| Senior Year. 2d Semester . | Elec | | Elec | | | | Pre. | | Pre. | | Elec | Pre. | Elec | Pre. | Pre. | Elec | | Elec | | Elec | Elec | Ext. | Ext. |

# STUDIES OF THE COURSE IN LETTERS.

Elective studies must be so chosen as not to interfere with those which are prescribed.

## FRESHMAN YEAR.

First Semester.—*Prescribed.*—French, 4; Mathematics, 4; English, 4; History, 4; Natural History, 2. Total, 18 Periods.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2; Elocution, 2.

Second Semester.—*Prescribed.*—German, 4; Mathematics, 4; English, 4; Rhetoric, 2; Natural History, 2; Elocution, 2. Total, 18 Periods.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2.

## SOPHOMORE YEAR.

First Semester.—*Prescribed.*—German, 4; Mathematics, 4; English, 4; Physics, 2; Natural History, 2; Electives, 4. Total, 20 Periods.

*Electives.*—Latin, 4; Pedagogics, 2; Elocution, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—French, 4; History, 4; English, 4; Physics, 2; Natural History, 2; Electives, 4. Total, 20 Periods.

*Electives.*—Latin, 4; Descriptive Astronomy, 2; Pedagogics, 2; Elocution, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

## JUNIOR YEAR.

First Semester.—*Prescribed.*—English, 4; History, 4; German, 4; Chemistry, 4; Electives, 4. Total, 20 Periods.

*Electives.*—Latin, 4; Physics, 4; Biology, 6=4; Pedagogics, 2; Elocution, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—English, 4; History, 4; French, 4; Electives, 8. Total, 20 Periods.

*Electives.*—Latin, 4; Chemistry, 4; Physics, 4; Biology, 6=4; Pedagogics, 2; Elocution, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

## SENIOR YEAR.

First Semester.—*Prescribed.*—English, 4; Mental and Moral Philosophy, 4; Political Science, 4; Logic, 1; Geology, 1; Elocution, 2; Electives, 4. Total, 20 Periods.

*Electives.*—Latin, 4; French, 4; Biology, 6=4; Mineralogy, 2; Pedagogics, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—English, 4; Mental and Moral Philosophy, 4; German, 4; Logic, 1; Geology, 1; Elocution, 2; Electives, 4. Total, 20 Periods.

*Electives.*—Latin, 4; Chemistry, 4; Political Science, 4; Biology, 6=4; Mineralogy, 2; Pedagogics, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

Physical Culture is required of all.

Essays are required throughout the course.

# Conspectus of Studies of the Course in Letters.

| | English, 4. | French, 4. | German, 4 | Mathematics, 4. | History, 4. | Natural History, 2. | Elocution, 2. | Rhetoric, 2. | Physics, 2. | Chemistry, 4. | Mental and Moral Philosophy, 4. | Political Science, 4. | Logic, 1. | Geology, 1. | Mineralogy, 2. | Physics, 4. | Descriptive Astronomy, 2. | Latin, 4. | Biology, 6=4. | Pedagogics, 2. | Phonography, 2. | Drawing and Painting, 2. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freshman Year. 1st Semester . . . | Pre. | Pre. | | Pre. | Pre. | Pre. | Ext. | | | | | | | | | | | | | Ext. | Ext. | Ext. |
| Freshman Year. 2d Semester . . . | Pre. | | Pre. | Pre. | | Pre. | Pre. | Pre. | | | | | | | | | | | | Ext. | Ext. | Ext. |
| Sophomore Year. 1st Semester . . . | Pre. | | Pre. | Pre. | | Pre. | Elec | | Pre. | | | | | | | | | Elec | | Elec | Ext. | Ext. |
| Sophomore Year. 2d Semester . . . | Pre. | Pre. | | | Pre. | Pre. | Elec | | Pre. | | | | | | | | Elec | Elec | | Elec | Ext. | Ext. |
| Junior Year. 1st Semester . . . | Pre. | | Pre. | | Pre. | | Elec | | | Pre. | | | | | | Elec | | Elec | Elec | Elec | Ext. | Ext. |
| Junior Year. 2d Semester . . . | Pre. | Pre. | | | Pre. | | Elec | | | Elec | | | | | | Elec | | Elec | Elec | Elec | Ext. | Ext. |
| Senior Year. 1st Semester . . . | Pre. | Elec | | | | | Pre. | | | | Pre. | Pre. | Pre. | Pre. | Elec | | | Elec | Elec | Elec | Ext. | Ext. |
| Senior Year. 2d Semester . . . | Pre. | | Pre. | | | | Pre. | | | | Pre. | Elec | Pre. | Pre. | Elec | | | Elec | Elec | Elec | Ext. | Ext. |

Essays required throughout the course.

# STUDIES OF THE COURSE IN SCIENCE.

Elective studies must be so chosen as not to interfere with those which are prescribed.

## FRESHMAN YEAR.

First Semester.—*Prescribed.*—Chemistry, 4; Mathematics, 4; French, 4; History, 4; Natural History, 2. Total, 18 Periods.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2; Elocution, 2.

Second Semester.—*Prescribed.*—Chemistry, 4; Mathematics, 4; German, 4; Rhetoric, 2; Natural History, 2; Elocution, 2. Total, 18 Periods.

*Extras.*—Phonography, 2; Drawing and painting, 2; Pedagogics, 2.

## SOPHOMORE YEAR.

First Semester.—*Prescribed.*—Chemistry. 8=4; Mathematics, 4; German, 4; Physics, 2; Natural History, 2; Electives, 4. Total, 20 Periods.

*Electives.*—Latin, 4; English, 4; Pedagogics, 2; Elocution, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—Chemistry, 8=4; Mathematics, 4; Mechanics, 4; Physics, 2; Natural History, 2; Electives, 4. Total, 20 periods.

*Electives.*—Latin, 4; English, 4; French, 4; History, 4; Pedagogics, 2; Elocution, 2; Descriptive Astronomy, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

## JUNIOR YEAR.

First Semester.—*Prescribed.*—Physics, 4; Chemistry, 8=4; Biology, 6=4; German, 4; Electives, 4. Total, 20 Periods.

*Electives.*—Mathematics, 4; History, 4; Pedagogics, 2; Elocution, 2; English, 4.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—Physics, 4; Chemistry, 8=4; English, 4; French, 4; Electives, 4. Total, 20 Periods.

*Electives.*—Mathematics, 4; History, 4; Latin, 4; Biology, 6=4; Pedagogics, 2; Elocution, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

## SENIOR YEAR.

First Semester.—*Prescribed.*—Biology, 6=4; Mental and Moral Philosophy, 4; Political Science, 4; Logic, 1; Geology, 1; Elocution, 2; Electives, 4. Total, 20 Periods.

*Electives.*—Astronomy, 4; Physics, 4; Chemistry, 4; French, 4; English, 4; Mineralogy, 2; Pedagogics, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—Mental and Moral Philosophy, 4; Logic, 1; Geology, 1; Elocution, 2; Electives, 12. Total, 20 Periods.

*Electives.*—Biology, 6=4: Political Science, 4; Astronomy, 4; Physics, 4; Chemistry, 4; Latin, 4; German, 4; English, 4; Mineralogy, 2; Pedagogics, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

Physical Culture is required of all.

Essays are required throughout the course.

# Conspectus of Studies of the Course in Science.

| | Chemistry, 4. | Mathematics, 4. | French, 4. | German, 4. | Natural History, 2. | History, 4. | Rhetoric, 2. | Elocution, 2. | Physics, 2. | Mechanics, 4. | Physics, 4. | Biology, 6—4. | English, 4. | Mental and Moral Philosophy, 4. | Political Science, 4. | Logic, 1. | Geology, 1. | Mineralogy, 2. | Latin, 4. | Descriptive Astronomy, 2. | Astronomy, 4. | Pedagogics, 2. | Phonography, 2. | Draw'g & Paint'g, 2. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freshman Year. 1st Semester . | Pre. | Pre. | Pre. | | Pre. | Pre. | Essays required throughout the course. | Ext. | | | | | | | | | | | | | | Ext | Ext | Ext |
| Freshman Year. 2d Semester . | Pre. | Pre. | | Pre. | Pre. | | | Pre. | | | | | | | | | | | | | | Ext | Ext | Ext |
| Sophomore Year. 1st Semester . | Pre. | Pre. | | Pre. | Pre. | | | Elec | Pre. | | | | Elec | | | | | | Elec | | | Ele | Ext | Ext |
| Sophomore Year. 2d Semester . | Pre. | Pre. | Elec | | Pre. | Elec | | Elec | Pre. | Pre. | | | Elec | | | | | | Elec | Elec | | Ele | Ext | Ext |
| Junior Year. 1st Semester . | Pre. | Elec | | Pre. | | Elec | | Elec | | | Pre. | Pre. | Elec | | | | | | | | | Ele | Ext | Ext |
| Junior Year. 2d Semester . | Pre. | Elec | Pre. | | | Elec | | Elec | | | Pre. | Elec | Pre. | | | | | | | | | Ele | Ext | Ext |
| Senior Year. 1st Semester . | Elec | | Elec | | | | | Pre. | | | Elec | Pre. | Elec | Pre. | Pre. | Pre. | Pre. | Elec | | | Ele | Ele | Ext | Ext |
| Senior Year. 2d Semester . | Elec | | | Elec | | | | Pre. | | | Elec | Elec | Elec | Pre. | Elec | Pre. | Pre. | Elec | | | Ele | Ele | Ext | Ext |

# STUDIES OF THE COURSE IN ENGINEERING.

Elective studies must be so chosen as not to interfere with those which are prescribed.

## FRESHMAN YEAR.

First Semester.—*Prescribed.*—Shop Work and Draughting, 6; Mathematics, 4; Chemistry, 4; Natural History, 2; Electives, 4. Total, 20 Periods.

*Electives.*—French, 4; History, 4; English, 4.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2.

Second Semester.—*Prescribed.*—Shop Work and Draughting, 6; Mathematics, 4; Chemistry, 4; Rhetoric, 2; Electives, 4. Total, 20 Periods.

*Electives.*—German, 4; English, 4.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2.

## SOPHOMORE YEAR.

First Semester.—*Prescribed.*—Descriptive Geometry and Surveying, 4; Shop Work and Draughting, 4; Mathematics, 4; Chemistry, 6=2; Physics, 2; Electives, 4. Total, 20 Periods.

*Electives.*—German, 4; English, 4.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2; Elocution, 2.

Second Semester.—*Prescribed.*—Mechanics, 4; Shop Work and Draughting, 4; Mathematics, 4; Chemistry, 6=2; Physics, 2; Electives, 4. Total, 20 Periods.

*Electives.*—French, 4; History, 4; English, 4; Elocution, 2; Descriptive Astronomy, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2.

## JUNIOR YEAR.

First Semester.—*Prescribed.*—Engineering, 6; Engineering Practice, 6=2; Mathematics, 4; Physics, 4; Electives, 4. Total, 20 Periods.

*Electives.*—Chemistry, 6=4; German, 4.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2; Elocution, 2.

Second Semester.—*Prescribed.*—Engineering, 6; Engineering Practice, 2; Mathematics, 4; Physics, 4; Electives, 4. Total, 20 Periods.

*Electives.*—Chemistry, 6=4; French, 4.

*Extras.*—Phonography, 2; Drawing and Painting, 2; Pedagogics, 2; Elocution, 2.

## SENIOR YEAR.

First Semester.—*Prescribed.*—Engineering, 8; Engineering Practice, 9=4; Elocution, 2; Logic, 1; Geology, 1; Electives, 4. Total, 20 Periods.

*Electives.*—Astronomy, 4; English, 4; French, 4; Chemistry, 4; Physics, 4; Mineralogy, 2; Pedagogics, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

Second Semester.—*Prescribed.*—Engineering, 8; Engineering Practice, 9=4; Elocution, 2; Logic, 1; Geology, 1; Electives, 4. Total, 20 Periods.

*Electives.*—Astronomy, 4; English, 4; German, 4; Chemistry, 4; Physics, 4; Mineralogy, 2; Pedagogics, 2.

*Extras.*—Phonography, 2; Drawing and Painting, 2.

Physical Culture is required of all.

Essays are required throughout the course.

# Conspectus of Studies of the Course in Engineering.

| | Engin'r'g Prac. 9=4. | Engineering, 4. | Engineering, 6. | Engineering, 8. | Engin'ring Pract., 2. | Engin'ring Pract., 4. | Mechanics, 4. | Mathematics, 4. | Chemistry, 4. | Chemistry, 6=2. | Physics, 2. | Natural History, 2. | Rhetoric, 2. | Physics, 4. | Elocution, 2. | Logic, 1. | Geology, 1. | Mineralogy, 2. | French, 4. | German, 4. | History, 4. | English, 4. | Desc. Astronomy, 2. | Biology, 4. | Astronomy, 4. | Political Science, 4. | Ment. & Mor. Phil. 4. | Pedagogics, 2. | Phonography, 2. | Draw'g & Paint'g, 2. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freshman Year. 1st Semester. | Pre | | | | | | | Pre | Pre | | | Pre | | | | | | | Ele | | Ele | Ele | | | | | Ext | Ext | | |
| Freshman Year. 2d Semester. | Pre | | | | | | | Pre | Pre | | | | Pre | | | | | | | Ele | | Ele | | | | | Ext | Ext | | |
| Sophomore Year. 1st Semester. | | Pre | | | | Pre | | Pre | | Pre | Pre | | | | Ext | | | | | Ele | | Ele | | | | | Ext | Ext | | |
| Sophomore Year. 2d Semester. | | | | | | Pre | Pre | Pre | | Pre | Pre | | | | Ele | | | | Ele | | Ele | Ele | Ele | | | | Ext | Ext | | |
| Junior Year. 1st Semester. | | | Pre | | Pre | | | Pre | Ele | | | | | Pre | Ext | | | | | Ele | | | | | | | Ext | Ext | | |
| Junior Year. 2d Semester. | | | Pre | | Pre | | | Pre | Ele | | | | | Pre | Ext | | | | Ele | | | | | | | | Ext | Ext | | |
| Senior Year. 1st Semester. | | | | Pre | | Pre | | | Ele | | | | | Ele | Pre | Pre | Pre | Ele | Ele | | | Ele | | | Ele | | Ele | Ext | | |
| Senior Year. 2d Semester. | | | | Pre | | Pre | | | Ele | | | | | Ele | Pre | Pre | Pre | Ele | | Ele | | Ele | | | Ele | | Ext | Ext | | |

Essays required throughout the course.

## GRADUATION AND DEGREES.

It will be seen that all the above courses of study require four years for their completion.

As a condition of graduation, each student must submit to the Faculty a satisfactory Oration or Essay, which he must be prepared to deliver in public, if required to do so.

### 1. THE DEGREE OF BACHELOR.

The degrees of Bachelor of Arts, of Letters, and of Science are conferred on the completion of the corresponding courses.

### 2. THE DEGREE OF MASTER.

Candidates for the Master's degree are required to pursue a course of study at Swarthmore, or elsewhere, under the direction of the Faculty, and to pass examination in the same.

Persons residing at the College, and devoting their whole time to the work, can accomplish a sufficient amount in one year; for non-resident candidates, who are at the same time engaged in other work, the course must occupy not less than two years.

Applications should be made directly to the Faculty, and should state the subject or subjects in which the applicants wish to present themselves. Work will then be assigned to them by the Faculty.

The examinations for the degrees will be both oral and written, and will be conducted by a committee of the Faculty, upon whose report the Faculty will decide upon the fitness of the candidate for the degree.

An extended thesis, bearing upon some part of the work assigned, will in all cases be required.

The degree of A.M. will be given to Bachelors of Arts who comply with the above conditions.

The degree of M.L. will be given to Bachelors of Letters who comply with the above conditions.

The degree of M.S. will be given to Bachelors of Science who comply with the above conditions.

### 3. THE DEGREE OF CIVIL ENGINEER.

The degree of C.E. will be conferred upon Bachelors of Science of the Engineering Department who shall have been engaged for not less

than three years, in professional practice, in positions of responsibility, and who shall present an acceptable thesis upon a subject pertaining to Civil Engineering.

Application for this degree must be made, and the thesis presented, at least *three months* before commencement.

# DEGREES CONFERRED IN 1888.

At the commencement in 1888 degrees were conferred upon the following graduates:

## BACHELOR OF ARTS.

ALICE M. ATKINSON . . . . . *Holicong, Pa.*
SADIE M. CONROW . . . . . *Cinnaminson, N. J.*
JOYEUSE L. FULLERTON . . . . . *Wenonah, N. J.*
ALICE HALL . . . . . *West Chester, Pa.*
J. RUSSELL HAYES . . . . . *West Chester, Pa.*
MARTHA P. JONES . . . . . *Conshohocken, Pa.*
HETTY C. LIPPINCOTT . . . . . *Riverton, N. J.*
JESSIE PYLE . . . . . *London Grove, Pa.*
AMELIA SKILLIN . . . . . *Glen Head, N. Y.*
CARROLL H. SUDLER . . . . . *Sudlersville, Md.*
ANNIE E. WILLITS . . . . . *Syossett, N. Y.*
FRANK P. WILSON . . . . . *Purcellville, Va.*

## BACHELOR OF LETTERS.

KATHERINE M. RIDER . . . . . *Brooklyn, N. Y.*
ESTHER M. WILLITS . . . . . *Old Westbury, N. Y.*

## BACHELOR OF SCIENCE.

JESSIE L. COLSON . . . . . *Daretown, N. J.*
E. LAWRENCE FELL . . . . . *Holicong, Pa.*
EMMA GAWTHROP . . . . . *Wilmington, Del.*
T. MONTGOMERY LIGHTFOOT . . . . . *Germantown, Pa.*
WILLIAM S. MARSHALL . . . . . *Milwaukee, Wis.*
CHARLOTTE M. WAY . . . . . *Tempe, Arizona.*

### In Engineering.

THOMAS J. BROWN . . . . . *Lincoln, Va.*
FRANK CAWLEY . . . . . *Woodstown, N. J.*
WILLIAM L. DUDLEY . . . . . *Washington, D. C.*

ROBERT P. ERVIEN . . . . . *Shoemakertown, Pa.*
P. SHARPLES HALL . . . . . *Philadelphia, Pa.*
WALTER W. HANCOCK . . . . . *Philadelphia, Pa.*
ELLIS P. MARSHALL . . . . . *London Grove, Pa.*
AARON C. PANCOAST . . . . . *San Antonio, Tex.*
JOSEPH J. RHOADS . . . . . *Bellefonte, Pa.*
WILLIAM H. SEAMAN . . . . . *Jericho, N. Y.*

## MASTER OF LETTERS.

ANNIE TYLOR MILLER . . . . . *Sandy Spring, Md.*

## MASTER OF ARTS.

GUION MILLER . . . . . *Sandy Spring, Md.*

## HONORARY DEGREES.

Doctor of Philosophy,
WILLIAM HYDE APPLETON.

Doctor of Science,
SUSAN J. CUNNINGHAM.

# THE PREPARATORY SCHOOL.

This school is intended to prepare students for the Freshman Class in the College, or to furnish a good practical education to those desiring a shorter course.

Instruction is given in Arithmetic, Algebra, and Geometry; in Astronomy, Physics, Chemistry, Natural History, and Physical Geography; in Reading and Speaking; in Geography and History; in the English, French, German, and Latin Languages; and in Manual Training. In the subject last mentioned there are two lines of instruction, one in Mechanical Drawing, and the other a course in Shop-practice. The Drawing includes the use of instruments and materials, the construction of geometrical problems, and the study of projections, plans, elevations, sections, intersections, and developments. The Shop-work consists of courses of instruction in carpentry and joinery, wood-carving, wood-turning, and pattern making; in forging, drawing out, upsetting, bending, punching, and welding iron and steel; in making and tempering tools; in moulding and casting in plaster, type-metal, brass, and iron. All the exercises are purely educational; no attempt being made to teach a trade.

It is expected that parents will not ask to have the course modified, except in the case of the few whose health will not admit of their doing the full amount of work prescribed.

Members of this school who are over 18 years of age may attend the college lectures on Pedagogics. Those who expect to teach the following year may substitute, for a part of the regular work, a thorough review of Arithmetic and the other elementary branches usually included in the examination of teachers for the public schools.

In arranging the course of study, we have had in view a complete and harmonious organization of all Friends' schools throughout the country; and it is hoped that committees and teachers of these schools will unite with us in securing this very important end. In all Friends' schools whose grade is so adjusted that certain classes, in the judgment of the Faculty, correspond with ours, students who complete the course of study in any class will be admitted to the class in this school corresponding with the next higher in their own, without re-examination, on presenting certificates to that effect from the Principals of their respective schools.

# INSTRUCTORS.

BENJAMIN SMITH, A.M.,
*Superintendent of Discipline of the boys.**

ESTHER T. MOORE, A.B.,
*In charge of Study Room.*

FERRIS W. PRICE, A.M.,
*Latin and English.*

WILLIAM PENN HOLCOMB, Ph.D.,
*History and Civil Government.*

MILTON H. BANCROFT,
*Industrial Drawing.*

GERRIT E. H. WEAVER, A.M.,
*German and French.*

WILLIAM CATHCART DAY, Ph.D.,
*Chemistry.*

MARY R. FIELD,
*Mathematics, Penmanship and English.*

GEORGE M. HOADLEY, C.E.,
*Physics.*

MARY J. MURPHY,
*Gymnastics.*

MYRTIE E. FURMAN, B.O.,
*Reading and Speaking.*

FRANK CAWLEY, B.S.,
*Shop Work.*

*The Discipline of the girls is in charge of the Matron of the College.

# PUPILS IN PREPARATORY SCHOOL.

## FIRST CLASS.

| *Names.* | *Courses.* | *Residences.* |
|---|---|---|
| R. Miller Baily | Science | *Wilmington, Del.* |
| Carrie C. Boice | Arts | *Plainfield, N. J.* |
| Horace Brinton | Arts | *West Chester, Pa.* |
| Mary R. Clawson | Irregular | *Plainfield, N. J.* |
| Mahlon H. Dickinson | Science | *Phila., Pa.* |
| William W. Goodwin, Jr. | Science | *Bordentown, N. J.* |
| Elizabeth G. Guilford | Arts | *Phila., Pa.* |
| Charles S. Hallowell | Science | *Denver, Col.* |
| Glentworth B. Hart | Science | *Sing Sing, N. Y.* |
| Alfred G. Horton | Irregular | *Scottsville, N. Y.* |
| Edward T. Lea | Science | *Sandy Spring, Md.* |
| William B. Lukens | Science | *Phila., Pa.* |
| Robert C. Manning | Science | *Trenton, N. J.* |
| C. Alice Paul | Arts | *Phila., Pa.* |
| Joseph M. Pugh | Science | *Port Deposit, Md.* |
| Jesse H. Reinhardt | Science | *Salem, N. J.* |
| Clarence W. Smith | Science | *Swarthmore, Pa.* |
| Frederic Wm. Speakman | Science | *Coatesville, Pa.* |
| Arthur Staab | Arts | *Santa Fé, N. M.* |
| Julius Staab | Arts | *Santa Fé, N. M.* |
| Albert M. Stiles | Science | *Volcano, W. Va.* |
| Frederic A. Storm | Irregular | *Bayside, N. Y.* |
| George H. Strout | Arts | *Portland, Me.* |
| Eva L. Tanger | Arts | *Hanover, Pa.* |
| John A. Thayer | Arts | *Charleston, W. Va.* |
| Mary Helen Train | Arts | *Zanesville, O.* |
| R. Randolph Turner | Arts | *Plains, Va.* |
| Charles H. Walton | Science | *Trenton, N. J.* |
| Georgie C. Washburn | Irregular | *Swarthmore, Pa.* |
| Walter L. Watson | Science | *Scranton, Pa.* |
| Alice C. Youmans | Arts | *Mt. Vernon, N. Y.* |

## SECOND CLASS.

| *Names.* | *Courses.* | *Residences.* |
|---|---|---|
| Charles Ballinger | Science | *St. Joseph, Mo.* |
| Morrison Barclay | Science | *Greensburg, Pa.* |
| Edwin P. Bond | Science | *Swarthmore, Pa.* |
| Frederic L. Brady | Science | *Irvington, N. Y.* |
| Anne R. Cooper | Arts | *Phila., Pa.* |
| Alonzo B. Davis | Science | *Phila., Pa.* |
| Jasper E. Dickinson | Irregular | *Manoa, Pa.* |
| James Dixon, Jr. | Science | *Easton, Md.* |
| Emma E. Donohugh | Arts | *Roxborough, Phila., Pa.* |
| Alfred W. Ellet | Science | *Eldorado, Kan.* |
| Charles G. Hallock | Science | *Peekskill, N. Y.* |
| Anna May Hart | Arts | *Sing Sing, N. Y.* |
| Evans Harvey | Science | *Brandywine Summit, Pa.* |
| Henry L. Heulings | Science | *Moorestown, N. J.* |
| Helen R. Hillborn | Arts | *Swarthmore, Pa.* |
| William Hoag | Science | *Quaker Street, N. Y.* |
| Henry Hoopes | Irregular | *Wilmington, Del.* |
| Rachel L. Hutchinson | Arts | *Newtown, Pa.* |
| Ernesto Jiminez | Irregular | *Habana, Cuba.* |
| Edward T. Kendall | Science | *Reading, Pa.* |
| Harriet M. Kent | Arts | *Swarthmore, Pa.* |
| Arthur Leggett | Science | *Williamsport, Pa.* |
| Herbert M. Lincoln | Science | *Phila., Pa.* |
| Gibbons W. Marsh | Science | *Ridley Park, Pa.* |
| Henry S. Matlack | Science | *Phila., Pa.* |
| Evelyn R. Merrihew | Arts | *Phila., Pa.* |
| W. Howard Paist | Science | *Leopard, Pa.* |
| H. Warren Richmond | Science | *Phila., Pa.* |
| Mary A. Rogers | Arts | *Medford, N. J.* |
| David B. Rushmore | Science | *Old Westbury, N. Y.* |
| Philip Sellers | Science | *Swarthmore, Pa.* |
| Millie Shattuck | Arts | *Brooklyn, N. Y.* |
| William W. Shattuck | Science | *Brooklyn, N. Y.* |
| Henry E. Simmons | Arts | *Moore's, Pa.* |
| Charles E. Spiegelberg | Science | *Santa Fé, N. M.* |
| Jacob Spiegelberg | Arts | *Santa Fé, N. M.* |

| *Names.* | *Courses.* | *Residences.* |
|---|---|---|
| Edward A. Staab | Arts | *Santa Fé, N. M.* |
| Oliver E. Stanton | Arts | *Montreal, Canada.* |
| Mabel Washburn | Arts | *Swarthmore, Pa.* |
| Edmund Willets | Science | *Roslyn, N. Y.* |

THIRD CLASS.

| | |
|---|---|
| Lloyd R. Blynn | *Phila., Pa.* |
| John Burnley | *Lenni, Pa.* |
| Thomas S. Donohugh | *Roxborough, Phila., Pa.* |
| Stewart A. Fritts | *Phila., Pa.* |
| W. Morton Reger | *Phila., Pa.* |
| Alexander Shreve | *Wrightstown, N. J.* |
| George W. Smith | *Minneapolis, Minn.* |
| Gilbert T. Smith, Jr. | *Sandy Spring, Md.* |
| Herbert T. Smith | *Swarthmore, Pa.* |
| Howard Throckmorton | *Chicago, Ill.* |
| Sands S. Weems | *Columbia, Texas.* |

# SUMMARY.

| | |
|---|---|
| First Class | 31 |
| Second Class | 40 |
| Third Class | 11 |
| Total | 82 |

## SUMMARY BY STATES.

| | |
|---|---|
| Pennsylvania | 37 |
| New York | 12 |
| New Jersey | 9 |
| New Mexico | 5 |
| Maryland | 4 |
| Delaware | 2 |
| West Virginia | 2 |
| Colorado | 1 |
| Illinois | 1 |
| Kansas | 1 |
| Maine | 1 |
| Minnesota | 1 |
| Missouri | 1 |
| Ohio | 1 |
| Texas | 1 |
| Virginia | 1 |
| Canada | 1 |
| Cuba | 1 |
| Total in Preparatory School | 82 |
| Total in College | 165 |
| Whole number | 247 |

# CONDITIONS OF ADMISSION.

**Application** for admission should be made in writing to the PRESIDENT of the College, and should in all cases be accompanied by a testimonial of good character from the pupil's last teacher.

**Examinations** for admission and classification will be held on Fourth-day, the 11th of Ninth month, 1889. Candidates must present themselves on the afternoon of Third-day, Ninth month 10th, 1889.

The pupils of this school are divided into two classes,—*First and Second.* For admission to the Second, or lowest class, the pupil must be at least fourteen years of age, and must be prepared in the following subjects:

**Arithmetic.**—The Fundamental Rules; Denominate Numbers; Common and Decimal Fractions; Percentage and Interest; Partnership; Ratio and Proportion; Involution and Evolution; Progression.

**Algebra.**—Addition, Subtraction, Multiplication and Division; Simple Equations; Fractions.

**English.**—The Parts of Speech; Analysis, and Parsing of Simple Sentences; the use of Capitals, and Spelling; an exercise in English Composition.

**Geography.**—Descriptive and Political Geography.

**History.**—The History of the United States as found in the school histories.

Candidates for the Classical Section will also be examined in:

**Latin.**—Leighton's Latin Lessons; ten chapters of Cæsar.

A class will be formed for those not up to the requirements in Latin.

Pupils from the schools named on page 27 will not be examined, but will be classified as recommended by the Principals of those schools. Such Students will come on the afternoon of Fourth-day, the 11th. A written statement in regard to scholarship from the pupil's last teacher, will, in all cases, receive due consideration.

## EXPENSES.

The charge for board and tuition and other expenses are found on pages 23 and 24.

# COURSE OF STUDY.

## SECOND CLASS.

**Mathematics.**—Algebra to Quadratics; Geometry, Books I., II. and III.

**English.**—Composition; Grammar; Selections from Longfellow and Hawthorne.

**History.**—History of England.

**Geography.**—Physical Geography.

**Chemistry.**—Lectures.

**Reading.**—Practice in Reading and Declaiming before the class.

**Spelling.**—Selected words; Dictations; Correction of misspelled words in all written exercises.

**Writing.**—The Spencerian System.

**Drawing.**—Free-hand Object Drawing and Perspective.

**Physical Culture.**—Exercises in the Gymnasium, as prescribed in each case by the Director.

### *Elective Studies.*

1. **Latin.**—a. *Reading:* Cæsar, Gallic War, two books; Virgil's Æneid, one book.

b. *Grammar:* Irregular Verbs; syntax of the cases.

c. *Composition:* Allen's Latin Composition and work based on the Latin read.

2. **French.**—First Lessons in French; Magill's First Reader.

3. **German.**—Grammar, and Practice in Writing Exercises; Ballads and easy Prose.

4. **Manual Training.**—Wood-working; Industrial Drawing, with instruments, and Free-hand. Pupils selecting Manual Training, omit the prescribed drawing above.

### FIRST CLASS.

**Mathematics.**—Geometry through Book V.; Review of Arithmetic; Algebra through Quadratic Equations of one unknown quantity.

**English.**—Rhetoric and Composition; a brief outline of the history of English Literature; Selections from Bryant and Lowell.

**History and Civil Government.**—Smith's Smaller Greece and Macy's Our Government.

**Physics.**—Lectures and Recitations.

**Astronomy.**—Descriptive Astronomy, with practice in finding the constellations and the principal stars.

**Reading.**—Practice in Reading and Declaiming before the class.

**Spelling.**—Selected words and Dictation Exercises; Correction of misspelled words in all written exercises of the class.

**Writing.**—The Spencerian System.

**Drawing.**—Free-hand Object Drawing and Perspective.

**Physical Culture.**—Exercises in the Gymnasium, as prescribed for each individual by the Director.

### *Elective Studies.*

1. **Latin.**—a. *Reading:* Virgil's Æneid, five books.

b. *Grammar:* Uses of the moods.

c. *Composition:* Allen's Latin Composition and work based on the Latin read.

2. **French.**—Magill's Grammar and Reader.

3. **German.**—Grammar and Practice in Writing Exercises; Ballads and easy Prose.

4. **Manual Training.**—Forging, etc., and Foundery Practice; Industrial Drawing, Mechanical and Free-hand. Pupils electing Manual Training omit the drawing prescribed above.

## ARRANGEMENT OF THE COURSES OF STUDY IN THE PREPARATORY SCHOOL.

CLASSICAL COURSE.—Latin required; also French and German in alternate semesters.

SCIENTIFIC COURSE.—Manual Training required; also French and German in alternate semesters.

In the Scientific course, Latin may be substituted for the French and German.

# PREPARATORY SCHOOL.

## COURSE OF STUDY.

SECOND CLASS (*Classical*), *First Semester.*—Latin, 4; Mathematics, 4; History, 4; French, 4; Writing and Spelling, 4; Physical Geography, 2; Reading and Speaking, 2. Total, 24 Periods.

*Second Semester.*—Latin, 4; Mathematics, 4; English, 4; German, 4; Free-hand Drawing, 4; Chemistry (Lectures), 2; Reading and Speaking, 2. Total, 24 Periods.

SECOND CLASS (*Scientific*), *First Semester.*—Manual Training 8=4; Mathematics, 4; History, 4; French, 4; Writing and Spelling, 2; Physical Geography, 2; Reading and Speaking, 2. Total, 22 periods.

*Second Semester.*—Manual Training, 8=4; Mathematics, 4; English, 4; German, 4; Writing and Spelling, 2; Chemistry (Lectures), 2; Reading and Speaking, 2. Total, 22 Periods.

FIRST CLASS (*Classical*), *First Semester.*—Latin, 4; Mathematics, 4; English, 4; German, 4; Free-hand Drawing, 4; Physics, (Lectures), 2; Reading and Speaking, 2. Total, 24 Periods.

*Second Semester.*—Latin, 4; Mathematics, 4; History, 4; French, 4; Writing and Spelling, 4; Descriptive Astronomy (Lectures), 2; Reading and Speaking, 2. Total, 24 Periods.

FIRST CLASS (*Scientific*), *First Semester.*—Manual Training, 8=4; Mathematics, 4; English, 4; German, 4; Writing and Spelling, 2; Physics (Lectures), 2. Reading and Speaking, 2. Total, 22 Periods.

*Second Semester.*—Manual Training, 8=4; Mathematics, 4; History, 4; French, 4; Writing and Spelling, 2; Descriptive Astronomy (Lectures), 2; Reading and Speaking, 2. Total, 22 Periods.

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