
Illinois *INDUSTRIAL* University,

URBANA, CHAMPAIGN COUNTY, ILL.

1878-9.

I N D E X .

<p>Admission - - - 26</p> <p>Agriculture, College of 29</p> <p>Agriculture, School of - - 29</p> <p>Aims of University - - 25</p> <p>Ancient Languages and Literature, School of - - - 79</p> <p>Appropriations, - - 18</p> <p>Architecture, School of - 53</p> <p>Art and Design, School of - 87</p> <p>Art Gallery, - - - 21</p> <p>Accredited High Schools, - 27</p> <p>Board, - - - 92</p> <p>Buildings and Grounds, - 18</p> <p>Calendar, - - - 96</p> <p>Chemistry, School of - 58</p> <p>Choice of Studies, - - 24</p> <p>Civil Engineering, School of - 48</p> <p>Colleges and Schools of University, 23</p> <p>Commerce, School of - - 88</p> <p>Certificates, County Superintend- ent's, - - - 26</p> <p>Degrees and Certificates, - 91</p> <p>Directory, I. I. U., 3d Page Cover, -</p> <p>Domestic Science, School of - 70</p> <p>Dormitories, - - - 92</p> <p>Examining Schools, - - 27</p> <p>Engineering, College of - - 39</p> <p>English and Modern Languages, School of - - - 76</p>	<p>Examinations, - - - 26</p> <p>Expenses, - - - 95</p> <p>Faculty, - - - 3</p> <p>Government, Students', - 93</p> <p>General Directions to Students, 94</p> <p>History of University, - - 17</p> <p>Horticulture, School of - - 34</p> <p>Labor, - - - 93</p> <p>Library, - - - 21</p> <p>Literature and Science, College of 74</p> <p>Location of University, - - 17</p> <p>Mechanical Engineering, School of 41</p> <p>Military Science, School of - 81</p> <p>Mining Engineering, School of 52</p> <p>Miscellany, - - - 91</p> <p>Museum and Collections, - 19</p> <p>Musical Department, - - 89</p> <p>Natural Science, College of - 58</p> <p>Natural History, School of - 64</p> <p>Organization of University, - 23</p> <p>Preparatory Studies, - - 90</p> <p>Property and Funds, - - 18</p> <p>Students, Names of, - - - 6</p> <p>Special Students, - - - 15</p> <p>Summary, - - - 16</p> <p>Trustees, Board of, - - - 2</p> <p>Uniforms, - - - 82</p> <p>Veterinary Science, - - - 31</p>
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LEARNING AND LABOR.

Catalogue and Circular

—OF THE—

Illinois Industrial University,

URBANA, CHAMPAIGN COUNTY, ILL.

1878-9.

CHAMPAIGN:
GEORGE SCROGGS, PRINTER.

1879.

BOARD OF TRUSTEES.

UNDER LAW OF MAY 7, 1873.

EX OFFICIO

HIS EXCELLENCY, GOVERNOR SHELBY M. CULLOM.
JAMES R. SCOTT, PRESIDENT STATE AGRICULTURAL BOARD.

TERM EXPIRES 1881.

A. M. BROWN, VILLA RIDGE.
EMORY COBB, KANKAKEE.
D. GARDNER, CHAMPAIGN.

TERM EXPIRES 1883.

R. B. MASON, CHICAGO.
T. T. FOUNTAIN, DUQUOIN.
ALEXANDER McLEAN, MACOMB.

TERM EXPIRES 1885.

J. J. BYRD, CAIRO.
JAMES C. CONKLING, SPRINGFIELD.
S. M. MILLARD, CHICAGO.

OFFICERS OF THE BOARD.

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EXECUTIVE COMMITTEE.

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D. GARDNER.
JAMES R. SCOTT.

S. W. SHATTUCK, BUSINESS AGENT.
JAMES D. CRAWFORD, LIBRARIAN.

OFFICERS AND INSTRUCTORS.

FACULTY.

JOHN M. GREGORY, LL. D.,
Regent, and Professor of Philosophy and History.

THOMAS J. BURRILL, M. A.,
Professor of Botany and Horticulture, and Secretary.

COL. SAMUEL W. SHATTUCK, M. A., C. E.,
Professor of Mathematics, and Vice-President.

COL. EDWARD SNYDER, M. A.,
Professor of Modern Languages.

DON CARLOS TAFT, M. A.,
Professor of Geology and Zoology.

*J. BURKITT WEBB, C. E.,
Professor of Civil Engineering.

JOSEPH C. PICKARD, M. A.,
Professor of English Language and Literature.

N. CLIFFORD RICKER, M. Arch.,
Professor of Architecture.

JAMES D. CRAWFORD, M. A.
Professor of Ancient Languages.

HENRY A. WEBER,
Professor of Chemistry.

GEORGE E. MORROW, LL. B.,
Professor of Agriculture.

*In Europe this year.

OFFICERS AND INSTRUCTORS.

SELIM H. PEABODY, Ph. D.,
Professor of Mechanical Engineering and Physics.

MISS LOU CATHERINE ALLEN,
Professor of Domestic Science and Preceptress.

FREDERICK W. PRENTICE, M. D.,
Lecturer in Veterinary Science.

FERNANDO A. PARSONS, M. L.,
Instructor in Book-Keeping.

PROF. PETER BAUMGRAS,
Instructor in Industrial Art and Designing.

MAJ. WILLIAM A. DINWIDDIE,
First Lieut. 2d Cavalry U. S. A.,
Professor of Military Science and Tactics.

MISS CHARLOTTE E. PATCHIN,
Instructor in Music.

IRA O. BAKER, C. E.,
Assistant in Civil Engineering and Physics.

MELVILLE A. SCOVELL, M. S.,
Instructor in Agricultural Chemistry.

CHARLES I. HAYS, B. S.,
Assistant in Horticulture and Botany.

CHARLES E. PICKARD, B. A.,
Assistant in English and Ancient Languages.

*First and second term.

OFFICERS AND INSTRUCTORS.

EDWIN L. LAWRENCE,
Head Farmer.

E. A. KIMBALL,
Foreman in Machine Shop.

*JOSEPH C. LEWELLIN, B. S.,
Assistant in Architecture and Foreman of Carpenter Shop.

C. W. CLARK, B. S.,
Assistant in Civil Engineering.

WILLIAM D. RUDY, B. S.,
Assistant in Chemical Laboratory.

GEORGE A. WILD,
Curator and Taxidermist.

*JOHN E. GREGORY,
Second Assistant in Chemical Laboratory.

†JOSEPH NESS,
Teacher of Elocution.

LORADO TAFT,
Teacher of Clay Modeling.

‡CHARLES C. BARNES,
Second Assistant in Chemical Laboratory.

‡NELSON S. SPENCER,
Foreman of Carpenter Shop.

*First and Second terms.

†First term.

‡Third term.

LIST OF STUDENTS.

EXPLANATION.

The course of studies are indicated as follows : Ag'l, Agricultural ; Hor., Horticultural ; M. E., Mechanical Engineering ; C. E., Civil Engineering ; Min. E., Mining Engineering ; Arch., Architecture ; Nat. His., Natural History ; Chem., Chemistry ; L. & S., Literature and Science ; Com., Commercial ; Mil., Military ; B. C., Builder's Course ; D. S., Domestic Science. *Partial.

RESIDENT GRADUATES.

Baker, Edward J	- - - - -	Savoy
Llewellyn, Joseph C	- - - - -	Sterling
Miss Gregory, Helen B	- - - - -	Champaign
“ Larned, Mary S	- - - - -	“
“ Mahan, Jennie C	- - - - -	“
“ Page, Emma	- - - - -	“
“ Page, Mary L	- - - - -	“
“ Piatt, Emma C	- - - - -	Monticello
Mrs. Coddington, Alice	- - - - -	Champaign
“ Ricker, N C	- - - - -	
“ Whitham, Nellie Page	- - - - -	Rankin

SENIOR CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Beardsley, Henry M	L & S	Champaign
Bourne, Harry P	C E	Woodstock
Butler, William N	L & S & Mil	Anna
Coburn, Ralph P.	M E & Mil	Chicago
Freijs, Charles T	Arch & Mil	Chicago
Gunder, James H	Min E	Fairmount
Hoit, Otis W	Ag'l	Geneseo
*Jackson, Arthur C	L & S	Maroa
Johnson, William P	C E & Mil	Chicago
Kays, Emory	Ag'l	Tonica
Kimble, Willis P	Min E	Paris
Kuhn, Isaac	Min E	Cleveland, Ohio

Lee, Elisha	Ag'l	Hamlet
Milton, Franklin S	C E	Jerseyville
Stanton, S Cecil	Chem & Mil	London, England
Swannell, Arthur	L & S & Mil	Kankakee
Taft, Lorado	L & S	Champaign
Thompson, William	Min E & Mil	Chicago
Walker, Frank E	L & S & Mil	Champaign
Whitmire, Clarence L	L & S	Metamora

LADIES.

Butts, Augusta E	Nat His	Union
Hale, Isabella	D S	Sheffield
Kimberlin, Nettie	D S	Louisiana, Mo
McAllister, Minnette C	L & S	Champaign
*McElroy, Mary	L & S	Bloomington

JUNIOR CLASS.**GENTLEMEN.**

NAME.	COURSE.	RESIDENCE.
Adams, Charles F	Nat His	Urbana
Allen, R Chandler	L & S	Gilman
Bailey, Willis J	L & S	Mount Carroll
*Barrows, Charles S	M E	Woodstock
Bills, Charles J	L & S & Mil	Garden Prairie
Bley, John C	M E & Mil	El Paso, Colorado
Boothby, Arthur	L & S	Pittsfield
Briles, Byard S	Ag'l	Ash Grove
Buckingham, Roswell H	M E & Mil	Chicago
Burroughs, Dent E	L & S & Mil	Edwardsville
Butler, Cyrus W	Nat His	Anna
Childs, William M	C E	Buda
Conklin, Roland R	L & S & Mil	Champaign
Cook, Charles F	Chem & Mil	Edwardsville
Farrell, Cornelius	L & S	Scribner, Neb
*Forsyth, James	Nat His	Springfield
Graves, Ernest W	Hort	Sandwich
Groves, Charles W	L & S & Mil	Champaign
Hafner, Chris. F	L & S & Mil	Oak Park
*Haines, J Wilbur	M E	Baraboo, Wis
Harden Edgar E	L & S & Mi	Dixon
Hatch, Frank W	L & S	English Prairie
Heidenheimer, Benjamin	M E & Mil	Chicago
Jones, R D	L & S & Mil	Lacon
*Lamson, John W	L & S & Mil	Half Day
Llewellyn, Henry S		Sterling
Mann, William A	M E	Gilman
Melendy, Clarence P	Ag'l	Mount Carroll
Merriam, Lauren B	C E & Mil	Champaign
*Nicolet, Charles H	M E	Champaign

Parker, W L	M E & Mil	Upper Alton
*Percival, Curtis E	Ag'l	Champaign
Robinson, Albert F	Min E	Jacksonville
Robinson, Arthur S	M E & Mil	Jacksonville, Fla
Russegue, George M	M E	Boston, Mass
Savage, George M	L & S	Champaign
Sondericker, Jerome	C E & Mil	Woodstock
Slee John G	L & S & Mil	Poughkeepsia, N Y
*Springer, Thomas W	L & S & Mil	Edwardsville
*Stacy, Morelle M	L & S	Princeton
Travis, William W	M E & Mil	Chenoa
White, Frank	C E & Mil	Stillman Valley

LADIES.

Bacon, Katharine	L & S	Champaign
*Kimball, Agnes M	L & S	Blivin's Mills
Kyle, Fannie E	L & S	Urbana
*Lucas, Corda	L & S	Camargo
Mansfield, Maria P		Mansfield
Parker, Minnie A	L & S	Decatur
Pearman, Ida	L & S	Champaign
*Scoggins, Sarah M		Champaign
Watson, Ella M	D S	DeKaib

SOPHOMORE CLASS.**GENTLEMEN.**

NAME.	COURSE.	RESIDENCE.
Allen, Jonas A	L & S	Elgin
Anderson, William N	Chem	Champaign
Armstrong, James E	Nat His	Seneca
Barnes, Charles C	Chem	Champaign
Beach, Bayard E	L & S & Mil	Champaign
Birney, Frank L	Chem	Urbana
Brereton, J Edwin	L & S & Mil	Clement
Bullen, John L	Ag'l & Mil	Moline
Coddington, Archibald O	L & S	Champaign
*Cole, Edward E	L & S	Champaign
Cole, John G	L & S & Mil	Champaign
*Collins, Wilbur M		Kuoxville, Iowa
Cooper, Fred E	Chem	Girard
Cummings, Orlando W	L & S	Buda
Davis, A E	L & S	Salem
*Dennis, Charles H	L & S & Mil	Decatur
Doering, Otto L	L & S	Central City
*Dressor, John C	Ag'l & Mil	Cottonwood Grove
Foster, Charles F	L & S & Mil	Curran
Gould, Llewellyn C		Henry
Hammett, Frank W	C E & Mil	Camargo

Hill, Frederick L	C E	Paxton
Hill, T Crawford	L & S & Mil	Tolono
Holmes, Horace P	L & S	Oregon
Howe, Charles F	Min E	Chicago
Jones, Isaac	L & S & Mil	Sweetwater
Kauffman, Adam E	Chem & Mil	Sterling
Kauffman, Walter N	L & S	Sterling
Kingman, A H	Chem & Mil	Wakefield, Mass
Lowe, Augustus Y	L & S & Mil	Jerseyville
McKay, Francis M	L & S	Ottawa
Mansfield, Willis A	L & S	Marengo
Mason, William K	Ag'l	Buda
Miller, Harry A	Arch	Buffalo, N Y
Miller, John H	Chem & Mil	Sheridan
*Morse, J H	L & S & Mil	Cazenovia
Neely, Charles G	L & S	DuQuoin
*Peadro, Benjamin F	L & S	Windsor
Pearman, I Ora	Chem	Champaign
Pepoon, Herman S	Nat His	Warren
Pepoon, William A	Ag'l	Warren
Philbrick, Ethan	C E & Mil	Baileyville
Pletcher, Francis M	Nat His	Plattville
Porter, F H	L & S & Mil	Garden Prairie
Robinson, William E	L & S	Greenville
Ross, Sprague D	L & S	Cottonwood
Scoggin, Charles W	M E	Champaign
Schwartz, Joseph	Chem	Salem
Slade, Byron A	Chem & Mil	Sycamore
Stull, Louis	Ag'l & Mil	Marengo
Sturman, James B	L & S	Dahlgren
Sutton, John T	L & S	Champaign
Talbot, Arthur N	C E & Mil	Cortland
*Thomas, Charles V	Ag'l	Kickapoo
VanOsdol, W S	Ag'l	Sterling
Weston, William S	L & S	Champaign
Williams, Frank H	M E & Mil	Moline
Wilkins, Harvey A	Arch & Mil	Champaign
Wilson, Maxwell B	Ag'l	Paris

LADIES.

Ayres, Blanche	L & S	Champaign
Baker, Kittie M	D S	Champaign
Barnes, Bertha E	L & S	Champaign
Carmack, Sarah E	D S	Camargo
Coddington, Ella M	L & S	Urbana
Davis, Marietta	L & S	Monticello
Hall, Lucy A		Champaign
Hammett, Jennie M	Nat His	Camargo
Harmon, Ada D	L & S	Champaign
Lawhead, Lucie M	L & S	Champaign

Lawrence, Nettie E	L & S	Champaign
Lucas, Anna B	L & S	Camargo
Macknet, Metta M Irene	L & S	Girard
Palmer, May	L & S	Champaign
*Searle, Clara	D S	Osborn
Thomas, Darley	L & S	Champaign
Victor, Mamie Y	L & S	Champaign
Wibley, Flora D	L & S	Emporia, Kan.
Wright, Jessie A	L & S	Champaign

FRESHMAN CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Abbott, Edward L	C E	Union Grove
Alexander, Henry O	L & S & Mil	Urbana
Allison, James G	L & S & Mil	McKinney, Tex.
Bacon, Theodore H	C E	Champaign
Baird, Jay C	L & S	Sterling
Barnes, William		Decatur
Blackburn, William	C E	Paris
Boyd, Comma	Ag'l	Sheffield
Bridge, Arthur M	L & S	La Moille
Bringhurst, Henry W	C E	Logansport, Ind
Brown, Albert S	L & S	Champaign
Brown, Howard	C E	Springfield
Bullard, Benjamin F	Chem	Mechanicsburg
Bullard, Geo W	Arch	Champaign
Carman, Augustine S	L & S	Champaign
Carman, William B	Chem	Champaign
Colton, Al. B	L & S	Galesburg
Coltrin, Weldon	L & S	Decatur
Conyne, William F	L & S	Warren
Craig, William P	L & S	Champaign
Cross, James C	L & S	Dahlgren
Curtiss, William G	Ag'l	Warren
Daniels, Edward M Jr	C E	Washington D C
Denton, Gilbert H	M E	Sycamore
Drum, Henry	L & S	Girard
Eaton, William T	C E	Warrensburg
Eisenmayer Andrew J	M E	Trenton
French, George H	C E	Milton
Garrett, James H	M E	Ashton
Gillette, Leslie B	L & S	Buffalo
Going, Judson F	L & S	Warren

Hartman, Ferris L	Chem	Chicago
Hogg, James	B C	Hannibal, Mo.
Huey, Joseph D	Nat His	Clement
Little, H P F	Chem	Champaign
Lydick, Frank H	Chem	Salem
McDonald, N F	L & S	Cimarron, Kan.
Maltby, Frank B	M E	Champaign
Merritt, Charles H	L & S	Waterman
Mohr, Louis	M E	Chicago
Neely, John R	L & S	DuQuoin
Newman, Wallace M		Plymouth
Orr, Robert E	C E & Mil	Champaign
Parr, Samuel W	M E	Gibson City
Palmer, Charles W	L & S	Watseka
Reed, Howard	Ag'l	Galesburg
Rice, George H	C E	Arlington
Richards, George W	L & S	Burton
Richmond, R B	M E	Macon
Roberts, Charles N	M E & Mil	Jefferson
Rugg, Frederick D	L & S	Champaign
Seymour, Arthur B	Nat His	Camp Point
Sharp, Abia J	M E	East Lynne, Mo
Shlaudeman, Frank	M E	Decatur
Smith, Charles L	L & S	Champaign
Smith, William H	L & S	Salem
Sparks, Charles F	Chem	Alton
Stevenson, Alexander C	Ag'l	Greencastle, Ind
Taft, Florizel A	Nat His	Champaign
Todd, James	M E	Elgin
Tunnell, D B	M E	Wyandotte, Kan
Turner, Herbert	Nat His	Quincy
Williams, Alfred H	Ag'l	Moline
White, Fred U	C E	Geneseo

LADIES.

Andrus, Dora A	L & S	Ashton
Avery, Kittie Clyde	L & S	Champaign
Brown, Lois M		Elmwood
Cole, Fronia R	D S	Champaign
Dresser, Gertrude E	L & S	Lindenwood
Elder, Loretta K	L & S	Mattoon
Little, L Belle		Champaign
McMath, Sadie A	L & S	Millington
Mosser, Maggie		Decatur
Page, Hannah M	Nat His	Champaign
Pearre, Henrietta L	L & S	Oakland, Cal
Robbins, M Jennie	D S	Wenona
Richner, Maggie		Champaign
Scovell, Mamie A	D S	Salem

PREPARATORY CLASS.

GENTLEMEN.

NAME.	COURSE.	RESIDENCE.
Aherin, Thomas	L & S	Girard
Allison, John W	L & S	Bismark
Armstrong, Charles G	M E	Seneca
Barnes, William L		Kirkwood
Barry, John D	Ag'l	Alton
Bates, Woodville		Bellefontaine, Mo.
Baumgras, Erwin		Urbana
Bebb, Edwin		Fountaindale
Bellamy, Albert	L & S	Girard
Bogardus, Edward F		Champaign
Booth, John McK		Claytonville, Mo
Bowen, Aaron L	M E	Savannah
Burns, Charles P	L & S	New Providence, Ind
Bunn, Harry C		Bloomington
Cheney Lellin S	C E	Champaign
Churchill, Frank L	L & S	Chenoa
Clafin, Charles	M E	Indianapolis, Ind
Constant, Robert F	Chem	Buffalo Hart
Cooper, Charles H	L & S	Urbana
Cumming, W A	L & S	Farmer City
Derrough, Austin	Ag'l	Philo
Dickson, Horace W		Arcola
Diesterweg, Charles L	M E	La Salle
Diffenbaugh, Henry	L & S	Dwight
Doering, Henry L	Chem	Central City
Donovan, John L	L & S	Watseka
Eichberg, David	L & S	Atlanta
Elmer, Irving A		Waterman
Elwood, Frank	Com	Decatur
Estabrook, Louis K	C E	Atlanta
Failing, Charles H		Macon
Folsom, Elmer	C E	Bloomington
Gaddis, John W	Arch	Olney
Gates, Alphonso S		Hamilton
Goltra, W F	C E	Bourbonnais Grove
Gordon, Edgar Z		Lynneville
Gregory, Grant	L & S	Champaign
Gregory, John E	Chem	Howell, Mich
Griffith, William V	Ag'l	Clear Creek
Hamilton, Vaden	C E	Atlanta
Harris, W Frank	Chem	Champaign
Harwood, Charles B	L & S	Champaign
Haywood, Irving	Chem	Lockport
Hazlit, John	Nat His	Marengo
Hetzel, John J	Com	Dwight

Hoffner, Wm C	Ag'l	Havana
Hudgens, Dana	M E	Sandwich
Hull, Willette B	Chem	Morris
Huntley, Converse R	Chem	DeKalb
James, John	Com	Mattoon
Jayne, Madison M .		Newton, Miss
Jennings, Edward R	Com	Mattoon
Jones Wilmer C		Champaign
Keith, Albert J	Arch	Paxton
Kelso, Elmer L	Chem	Paxton
Kemman, Alphonso H	Ag'l	La Grange
Kenower, John T	Ag'l	Clement
Kester, Frank A	M E & Mil	Danville
Kimmel, Daniel L	L & S	Elkville
Kirkpatrick, Charles S	Chem	Mayview
Kirkpatrick, Samuel,	Chem	Mayview
Kneussl, Otto	M E	Ottawa
Kutnewsky, John K	L & S	Groveland
Lawrence, Philip E		Galesburg
Lewis, Ralph D	Hort	Champaign
McCann, Charles F	Com	Cincinnati, Ohio
McFall, Howard M	Chem	Mattoon
Mathers, Eugene		Mason City
Miller, Aylett P	C E	Chicago
Moore, George L		Chatham
Moore, William D		Chatham
Morris, R B		
Noble, Thos	Chem	Todd's Point
Nungesser, John	L & S	Mascoutah
Nye, Charles C	Ag'l	Decatur
O'Halloran, Joseph	C E	La Salle
Olcott, Edward L	L & S	Chicago
Page, Arthur T	M E	Garden Prairie
Parker, J F	L & S	Griggsville
Peabody, Arthur	Arch	Champaign
Peck, John A	L & S	St. Louis, Mo
Postel, Julius	L & S	Mascoutah
Raffety, A L		Vermillion
Raffety, G W		Vermillion
Ramsay, George H	Ag'l	Trenton
Read, Harry J		Chicago
Read, Wm T B jr	C E	Chicago
Reed, Joseph H	L & S	Cairo
Richie, Benjamin C		Georgetown
Rogers, James H	Ag'l	Warren
Shallenberger, Ashton C		Toulon
Shaw, Alvin A	L & S	Annawan
Sim, Edward T		Urbana
Singer, Wm A	Chem	Peoria
Slauson, Howard	L & S	Dwight
Smith, Henry O	Nat His	Yorkville

Spencer, Nelson S	Arch	Dixon
Spring, Harry B	C E	Olney
Starr, Nathan	L & S	Paris
Stillwell, Homer A	L & S & Mil	Urbana
Thayer, Raymond C		Urbana
Tunnell, Charles W	Chem	Edwardsville
Wade, Harry M	L & S	Watseka
Walter, Wayne M	Arch	Medora
Wheeler, John	L & S	Plano
White, Charles H	Chem	Bloomington
White, John J	M E	Stillman Valley
White, Menzo	L & S	Atlanta, Ga
Whitman, Marcus F	C E	Como
Whitmire, James H	B S	Metamora
Whitmore, Jesse K	M E	Dixon
Williams, Elmer B		Farm Ridge
Wilson, M C		
Womacks, Wilson E	L & S	Champaign
Wray, Archibald M	Ag'l	Richmond
Wright, H F		

LADIES.

Anderson, Ida V	L & S	Champaign
Babb, Alice M		Champaign
Burton, E Lynne		Shiloh Center
Canady, C Della		Urbana
Everett, M Kate	Com	Champaign
Fellows, Clara	L & S	Farmer City
Gordon, Jessie B		Lynneville
Gulick, M Josie	Com	Champaign
Hollister, Nannie D		Champaign
Howell, Lemira		Champaign
Hubbart, Mary F	L & S	Monticello
Jenks, M Idalette		Earlville
Jenks, S Belle		Tremont
Lewis, C Florence	L & S	Farmer City
McLean, Susie		Champaign
McNeil, Mary A	D S	Pinckneyville
Marquiss, Emma E		Monticello
Perkins, Alice A	D S	Tremont
Reed, E May		Urbana
Russell, Annie S		Champaign
Savage, Alice E	L & S	Girard
Shaw, Anna B	D S	Tremont
Smith, Hattie M		Muscatine, Iowa
Smith, Nora A		Murdock

SPECIAL STUDENTS.

AGRICULTURE.

Blackburn, Milton A.....	Paris.
Crum, Charles E.....	Virginia.
Nixon, John A.....	Marshalltown, Ia.
Primm, James.....	Pinckneyville.
Smith, Eddie E.....	Davis.
Swanzy, Lucius M.....	Ridott.
Taggart, James E.....	Ridott.
Ulrich, Robert V.....	Peoria.
Wallace, Charles H.....	Homer.
Woodrow, Charles N.....	Green Valley.

CHEMISTRY.

Dodge, W. C.....	Chicago.
Earle, F. S.....	Cobden.
Spradling, Bayard T.....	Sheridan.

DRAWING AND PAINTING.

Ayers, Lois Sigourney.....	Urbana.
Baumgras, Irene.....	Urbana.
Crawford, Mrs. J. D.....	Champaign.
Heath, Ella.....	Champaign.

MUSIC.

Alexander, Genevieve.....	Urbana.
Brandon, Allie.....	Champaign.
Cord, Linnie.....	Urbana.
Heath, Susie E.....	Champaign.
Heiss, Alice.....	Mechanicsburg.
Hollister, Minnie.....	Urbana.
Hubbard, Minnie.....	Urbana.
Huff, Bertie.....	Champaign.
Moray, Aggie.....	Philo.
Rennick, Minnie.....	Champaign.
Romine, S. Lou.....	Champaign.
Scudder, Dellie.....	Champaign.
Stickle, Anna.....	Monticello.
Burrill, Mrs. T. J.....	Urbana.
Chase, Mortimer.....	Urbana.
Knibloe, Walter E.....	Gilman.

SUMMARY.

Resident Graduates—Gentlemen	2	
Ladies	9	11
	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/>	
Seniors—Gentlemen	20	
Ladies	5	25
	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/>	
Juniors—Gentlemen	42	
Ladies	9	51
	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/>	
Sophomores—Gentlemen	59	
Ladies	19	78
	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/>	
Freshmen—Gentlemen	64	
Ladies	14	78
	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/>	
Preparatory—Gentlemen	116	
Ladies	24	140
	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/>	
Special—Gentlemen	15	
Ladies	18	33
	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/>	
Total		<hr style="width: 50px; margin-left: auto; margin-right: 0;"/> 416

Illinois Industrial University.

HISTORY.

The Illinois Industrial University, the State University of Illinois, had its origin in a movement for the higher education of the industrial classes, begun in 1851, and resulting in the congressional grant of lands for this purpose, made to the several States in 1862, and amounting in this State to 480,000 acres. The University was chartered in February, 1867, and opened to students in March, 1868. In addition to the endowment from the land grant, over \$400,000 were donated by Champaign County in bonds, buildings and farms. The State has also made large appropriations for fitting up and stocking the farms, for library and apparatus, and for buildings, including the large Main Building erected in 1872 and 1873, the Mechanical Building and Drill Hall, and the Chemical Laboratory. Successive Colleges and Schools have been added as required, till four Colleges, including fifteen distinct Schools, have been organized.

The whole number matriculated as students since the opening is 1371. The number graduated from the several Colleges, including the class of 1878, is 202. In 1871 the University was opened for lady students, on the same terms as to gentlemen. In 1874 a fine Art Gallery was established. In 1876 the University received from the centennial exposition at Philadelphia, three diplomas and a medal. In 1878 its exhibit at the Paris International Exposition gained the gold medal.

LOCATION.

The University has a beautiful and healthful situation on the high grounds between the cities of Champaign and Urbana, and within the corporate limits of the latter. It is one hundred and twenty-eight miles south from Chicago, at the junction of the Illinois Central railroad and the Indiana, Bloomington and Western railway. The county is a region of beautiful rolling

prairies, with large belts of timber along the streams, and is one of the richest farming districts in the State.

BUILDINGS AND GROUNDS.

The domain occupied by the University and its several departments embraces about 623 acres, including stock farm, experimental farm, orchards, gardens, nurseries, forest plantations, arboretum, ornamental grounds, and military parade ground.

The University buildings, fifteen in number, include a grand Main Building for public use, one large and two small Dormitory Buildings, a spacious Mechanical Building and Drill hall, a large Chemical Laboratory, a Veterinary Hall, a small Astronomical Observatory, three dwellings, two large barns, and an ample Green-house.

The Mechanical Building and Drill Hall is of brick, 126 feet in length and 88 feet in width. It contains a boiler, forge and tank room; a Machine Shop, furnished for practical use, with a steam engine, lathes, and other machinery; a pattern and finishing shop, shops for carpentry and cabinet work, furnished with wood-working machinery; paint and draughting-rooms, and rooms for models, storage, etc. In the second story is the large Drill Hall, 124 by 80 feet, sufficient for the evolutions of a company of infantry, or a section of a battery of field artillery. It is also well supplied with gymnastic apparatus. One of the towers contains an armorer's shop and military model room, an artillery room and a band room. The other contains a printing office and editor's room.

The large Dormitory Building is 125 feet in length and five stories in height. It affords 80 private rooms for students. Two smaller Dormitory Buildings contain eight rooms each. The new Chemical Building, erected in 1878, at a cost, including furniture, of \$40,000, contains five laboratories, and is one of the best and largest in the United States.

PROPERTY AND FUNDS.

Besides its lands, buildings, furniture, library, etc., valued at \$470,000, the University owns 25,000 acres of well-selected lands in Minnesota and Nebraska. It has also endowment funds invested in State and County bonds amounting to \$319,000, besides other property and avails, valued at \$33,000. The State has appropriated \$25,000 to the Agricultural Department for barns, tools, stock, etc.; \$25,000 to the Horticultural Department for green-

house, barns, drainage, tools, trees, etc. ; \$25,000 for Mechanical and Military Building, machinery, etc. ; \$127,000 toward the erection of the Main Building, and furnishing the same ; \$10,500 for Chemical Apparatus ; \$25,000 for Library ; \$5,000 for the Apparatus of a Physical Laboratory ; \$3,000 for a Veterinary Hall, Stable and Apparatus ; \$40,000 for Chemical Building ; besides smaller amounts for agricultural experiments, etc.

MUSEUM AND COLLECTIONS.

The Museum already contains collections illustrating the several departments of science, unusually rich and equalled at few, if any, of the Colleges of the West. Among these collections are included the following :

Fossils.—Casts of the most remarkable fossils hitherto discovered in the various geological formations, illustrating the general progress of life in the molluscs, fishes, reptiles and mammals, from the oldest paleozoic time to the present. Also a fine set of fossils obtained from Germany, besides collections of fossils of this and other States, well illustrating the different formations, and suitably arranged for practical study.

Conchology.—A large collection of shells fully illustrating the principles of conchology, as to growth, form, habits, etc., representing all the classes and orders by their typical genera and species. The fluviatile shells of the State are fully exhibited, while the specimens of marine and land shells are also abundant.

Osteology.—The skeletons include mounted specimens of all the orders of birds and mammals, with the single exception of the order of proboscidea ; also typical representatives of the amphibious reptiles and fish.

The Mammals comprise an unusually large and complete collection of the ruminants of our country, including male and female elk, bison, deer, antelope, etc. Also some of the larger carnivores and fur bearing animals, and numerous rodents.

Ornithology.—The collection of stuffed birds is very large, including representatives of all the orders, and embracing most of the families of North America, as also a number of characteristic tropical forms.

Entomology.—The collection includes about three thousand species of insects, illustrating all the orders, and giving types of numerous families.

Botany.—The herbarium contains about one thousand species of plants, indigenous to Illinois, including nearly complete

sets of the grasses and sedges. There are beside many other North American plants and some exotics. A collection of Fungi includes examples of those most injurious to other plants, causing rusts, smuts, moulds, etc.

A collection of wood specimens from two hundred species of North American trees, well illustrates the variety of native wood. The trees and shrubs of Stephenson County, Illinois, are represented by another collection.

Plaster casts of fruits represent many of the leading varieties, as well as interesting specimens, showing peculiarities of growth, effects of cross fertilization, etc.

Lithology.—This collection embraces the principal kinds of metamorphic and volcanic rocks; examples of stratification in the limestone and fragmental kinds, with many samples of such rocks as are found most valuable for building purposes.

Mineralogy.—The specimens of minerals show all the groups, and all the important and typical species. All the metals are represented, also many of their most important combinations. Many of the specimens are finely crystallized, with which, and a complete set of important models, crystallography is fully illustrated.

Agricultural.—A large collection of soils from different portions of Illinois, and other States; samples of some hundreds of varieties of corn, wheat, and other cereals and seeds; specimens illustrating the official State Inspection of grains at Chicago, showing the quality of the different grades recognized; a collection of grains, seeds, nuts, etc., from Brazil; some hundreds of models of agricultural inventions; models illustrating modes and materials for drains; casts of ancient plows; engravings, lithographs and photographs of typical animals of noted breeds.

The Farms give good illustrations of farm buildings, implements, machinery, modes of culture, and of domestic animals of various classes.

Physics.—The Cabinets of the Physical Laboratory contain a collection of apparatus from the most celebrated European and American makers, costing over \$5,000, and illustrating the subjects of Mechanics, Pneumatics, Optics, Heat and Electricity. Ample facilities are afforded to the students for performing experiments of precision by which the theories of Physical Science may be tested and original work may be done.

The Mechanical Laboratory is provided with a Steam-Engine, Engine and hand lathes, planer, drill presses, and the

requisite hand tools, benches, vices, anvils, etc., for pattern shop, blacksmith shop, moulding room, and bench work. Its cabinets contain several hundred models of elements of mechanism and machines from Schroeder, Riggs, the patent-office, and from the work shops of the University.

Mining Engineering is illustrated by a valuable series of models, obtained from Freiburg, at a cost of \$2,000, illustrating sections of mines, machinery for elevating and breaking ores, with furnaces and machinery for metallurgical processes.

ART GALLERY.

The University Art Gallery is one of the largest and finest in the West. It was the gift of citizens of Champaign and Urbana. It occupies a beautiful hall, 61x79 feet, and the large display of Art objects has surprised and delighted all visitors. In Sculpture, it embraces thirteen full size casts of celebrated Statues, including the Laocoon Group, the Venus of Milo, etc. Forty Statues of reduced size and a large number of Busts, ancient and modern, bas reliefs, etc., making over 400 pieces. It includes also hundreds of large Autotypes, Photographs and fine Engravings, representing many of the great master-pieces of painting of nearly all the modern schools. Also a Gallery of Historical Portraits, mostly large French Lithographs of peculiar fineness, copied from the great National Portrait Galleries of France. The value of this splendid collection, as a means of education, is already showing itself in the work of the School of Drawing and Design of the University.

LIBRARY.

The Library, selected with reference to the literary and scientific studies required in the several courses, includes over 11,000 volumes, and additions are being made every year. During the year ending June 1, 1879, over 800 volumes have been added and an equal increase may be expected the coming year. Of the departments represented in the Library, the following are especially strong in proportion to the size of the Library :

Agriculture.....	1,300	volumes.
Natural History, and Chemistry.....	1,400	“
Engineering, Architecture and Mathematics.....	1,700	“
English Literature.....	1,500	“
Philosophy, Political and Social Science.....	600	“
History	2,300	“

Of the latter, nearly 900 volumes are on American History and Biography. There are beside nearly three thousand pamphlets, in cases, classified and as easy of access as the bound volumes.

The large Library hall, fitted up as a reading room, is open throughout the day for study, reading and consultation of authorities. It is intended that the use of the Library shall largely supplement the class-room instruction in all departments. Constant reference is made in classes to works contained in the Library, and their study encouraged or required. The reading-room is well provided with American, English, French, and German, papers and periodicals, embracing some of the most important scientific and art publications. The following periodicals are regularly received:

<p>AGRICULTURAL AND HORTICULTURAL.</p> <p>Prairie Farmer, Western Rural, Rural New Yorker, Country Gentleman, New England Farmer, Indiana Farmer, California Farmer, Willamette Farmer, Practical Farmer, Farmer and Fruit Grower, Agricultural Gazette, <i>London</i>, Gardener's Chronicle, <i>London</i>, Journal d'Agriculture Pratique, <i>Paris</i>, Revue Horticole, <i>Paris</i>, American Agriculturist, Western Agriculturist, Live Stock Journal, Horticulturist, Western Farmer, Wallace's Monthly, Scientific Farmer, Farmers' Review, Veterinarian, <i>London</i>, Recueil de Medicine Veterinaire, <i>Paris</i>, Drainage and Farm Journal,</p> <p>ENGINEERING.</p> <p>Encyclopedie d'Architecture, <i>Paris</i>, Engineering, <i>London</i>, Architect, <i>London</i>, Builder, <i>London</i>, Skizzen-buch, <i>Berlin</i>, Railroad Gazette, Scientific American,</p>	<p>Scientific American Supplement, VanNostrand's Engineering Magazine, The Workshop, American Architect, Universal Engineer, Western Manufacturer, Gazette of Patent Office,</p> <p>SCIENTIFIC.</p> <p>Nature, <i>London</i>, Grevillea, <i>London</i>, Comptes Rendus. <i>Paris</i>, Chemical News, <i>London</i>, American Chemical Journal, Polytechnisches Journal, <i>Augsburg</i>, Jahrbuch der Chemie. <i>Giessen</i>, Annalen der Chemie, <i>Leipsic</i>, Berichte der Deutschen Chemischen Gesellschaft, <i>Berlin</i>, Sanitarian, Popular Science Monthly, American Journal of Mathematics, Quarterly Journal of Microscopical Science, American Journal of Science and Art, American Naturalist, Journal of Franklin Institute, Mathematical Quarterly,</p> <p>LITERARY AND NEWS.</p> <p>New England Journal of Education, New Englander, International Review, Edinburgh Review, London Quarterly Review,</p>
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British Quarterly Review,
 North American Review,
 Atlantic Monthly,
 Scribner's Monthly,
 Library Journal,
 Literary World
 American Journal of Education,
 Magazine of American History,
 Legal Adviser,
 Revue des Deux Mondes, *Paris*,
 Deutsche Rundschau, *Berlin*,
 Princeton Review,

Nation,
 Congressional Record,
 Army and Navy Journal,
 London Daily News.
 Champaign County Gazette,
 Champaign County Herald
 Champaign Union,
 Champaign Times,
 Urbana Bulletin,
 Danville News,
 The Watchman, *Boston*.

ORGANIZATION OF THE UNIVERSITY.

COLLEGES AND SCHOOLS.

The Institution is a true University in the best American sense, though differing designedly in the character of some of its Colleges from the older Institutions of this country. It embraces four Colleges, which are subdivided into Schools. A School is understood to embrace the course of instruction needful for some one profession or vocation. Schools that are cognate in character and studies, are grouped under the same College. The following are the Colleges and Schools:

I. THE COLLEGE OF AGRICULTURE.

School of Agriculture.

School of Horticulture.

II. COLLEGE OF ENGINEERING.

School of Mechanical Engineering.

School of Civil Engineering.

School of Mining Engineering.

School of Architecture.

III. COLLEGE OF NATURAL SCIENCE.

School of Chemistry.

School of Natural History.

School of Domestic Science.

IV. COLLEGE OF LITERATURE AND SCIENCE.

School of English and Modern Languages. School of Ancient Languages.

V. ADDITIONAL SCHOOLS.

School of Military Science.

School of Commerce.

School of Art and Design.

Vocal and Instrumental Music, Telegraphing and Photography are also taught, but not as parts of the regular courses.

CHOICE OF STUDIES.

It has been a favorite aim of the University from the outset, to allow as much freedom as possible in the selection of studies.

A University is designed not for children, but for men and women, who may claim to know something of their wants, powers and tastes. It is not useful to require every student, without regard to his capacity or practical wants, to take entire some lengthened "course of study." Each student should weigh carefully his own powers and needs and counsel freely with his teachers as to the branches he may need to fit him for his chosen career, and then should pursue them with earnestness and perseverance, without faltering or fickleness.

It is necessarily required, 1st, That the student shall be thoroughly prepared to enter and keep pace with the classes in the chosen studies ; and, 2d, That he shall take these studies in the terms in which they are taught, 3d, Candidates for a degree must take the course of studies prescribed for that degree

Each student is expected to have three distinct studies, affording three class exercises each day. On special request, the Faculty may allow less or more.

No change in studies can be made after the beginning of a term, without permission of the Faculty.

Due care will be taken to prevent, as far as possible, all abuse of the liberty of choice. Students failing to pass satisfactory examinations in their chosen studies, will not be permitted to remain and take other studies without a vote of the Faculty.

REQUIRED STUDIES.

To secure the diffusion of the sciences relating to the great industries, the State Legislature, in 1873, prescribed that each student should be taught some of those sciences.

The Trustees accordingly made the following classification of studies, and they require that each student shall take, each term, one study at least from the first class. The second study

must be of either the first or second class, and the remaining studies from either of the three classes.

CLASS I. Physics, Chemistry, Mineralogy, Physical Geography, Anatomy and Physiology, Botany, Zoology, Geology, Entomology, Algebra, Geometry, Trigonometry, Calculus, Drawing, Surveying and Engineering, Mining, Metallurgy, Mechanics, Architecture, Principles of Mechanism, Hydraulics, Thermodynamics, Strength of Materials, Prime Movers, Mill Work, Machine Drawing, Origin and Treatment of Soils, Culture, etc., of Plants, Breeding of Domestic Animals, Veterinary Science, Farm Products and Manufactures, Roads and Railroads, Book-Keeping, Construction and Use of Machinery, Modeling and Patterns, Bridges, etc., Astronomy, Military Science and Domestic Science.

CLASS II. English Language and Literature, German Language and Literature, French Language and Literature, General History, United States History, Ancient History, Mediæval History, Modern History, Constitutional History, History of Civilization, Logic, Political Economy, History of Agriculture, Constitutional Law, International Law, Rhetoric and Oratory.

CLASS III. Any study taught in the University not enumerated in the first and second classes.

AIMS OF THE UNIVERSITY.

The University being both State and National in origin, its aims are defined by the following extracts from the laws of Congress and of the State Legislature :

"Its leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislature of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."—*Act of Congress, 1862, Sec. 4.*

"The Trustees shall have the power to provide the requisite buildings, apparatus, and conveniences, to fix the rates of tuition, to appoint such professors and instructors, and establish and provide for the management of such model farms, model art, and other departments and professorships as may be required to teach, in the most thorough manner, such branches of learning as are related to agriculture and the mechanic arts, and military tactics, without excluding other scientific and practical studies."—*Act of General Assembly, 1867, Sec. 7.*

In accordance with the two acts above quoted, the University holds, as its principal aim, to offer freely the most thorough instruction which its means will provide, in all the branches of learning useful in the industrial arts, or necessary to "the liberal and practical education of the industrial classes, in the several pursuits and professions in life." It includes in this all useful learning—scientific and classical,—all that belongs to sound and thorough scholarship.

EXAMINATIONS FOR ADMISSION.

Examinations of candidates for admission to the University, or any of its departments, are held at the University itself, the day previous to the opening of each term. These examinations embrace the following studies:

1. English Grammar, Arithmetic, Geography and History of the United States, for all the Colleges. These examinations are as thorough as those required for second-grade certificates for teachers in the public schools.

2. Algebra, including equations of second degree and the calculus of radical quantities; Geometry plain and solid. These are required also for all the Colleges.

3. Physiology, Botany, Natural Philosophy, Book-Keeping, single and double entry; English Rhetoric and Composition. These are required additional to 1 and 2 for candidates for the Colleges of Agriculture, Engineering and Natural Science.

4. Physiology, Botany, Natural Philosophy and Latin Grammar and Reader. Cæsar, Cicero and Virgil, Latin Prose; two year's work,—additional to 1 and 2 for School of English and Modern Languages.

5. Latin—two years, (as in 4) and Greek Grammar and Reader, four books of Xenophon's Anabasis, and Greek Prose Composition, additional to 1 and 2, for candidates for School of Ancient Languages.

For further information concerning terms of admission, see "*Admission*" under the several Colleges; also "*Preliminary Year.*"

To prevent loss to those who are not prepared to enter the University, but might come, hoping to pass the examinations for admission, the following arrangement has been made:

COUNTY SUPERINTENDENT'S CERTIFICATES.

County Superintendents of Schools will be furnished with questions and instructions for the examinations of candidates in

the four common branches, Arithmetic, Geography, English Grammar and History of the United States ; those who pass creditably will, when they present the Superintendent's certificate to that effect, be admitted to the Preliminary Classes.

EXAMINING SCHOOLS.

The Trustees have authorized the Faculty to designate one or more High Schools in each County of the State, of sufficiently high grade and good reputation, whose certificates of examination, in the branches required of candidates for the University, may be received in lieu of the usual examination of the University.

These must be Graded, or High Schools of good reputation, and of sufficiently extended course to prepare students for the University. The principal teachers of the schools selected for this class will be authorized to prepare questions and conduct examinations of any of their students desirous of entering the University, but the papers must be sent to the University for final decision. The following is a list of the Schools already accepted as

EXAMINING SCHOOLS.

Rockford West High School.....	J. H. Blodget, Principal.	
Tuscola High School.....	E. J. Hoenshal,	“
Buda High School.....	J. V. Wilkinson,	“
Kankakee High School.....	C. W. Rolfe,	“
Maplewood High School.....	S. F. Hall,	“
Sterling, 2d Ward High School.....	Alfred Bayliss,	“
S. Belvidere High School.....	J. W. Gibson,	“
Geneseo High School.....	B. F. Barge,	“
Belvidere High School.....	— Sherrill,	“
Lanark High School....	F. T. Oldt,	“
Gibson City High School.....	J. W. Mercer,	“

ACCREDITED HIGH SCHOOLS.

In addition to the Examining Schools above mentioned, the Faculty are authorized, after personal examination, to appoint accredited High Schools, whose graduates may be admitted to the University without further examination. These must be schools of first-rate character, whose courses of instruction include all the studies required for admission to some one of the colleges of the University. On application, a member of the Faculty is sent to examine the school making the application, as to its facilities

for teaching, its course and methods of instruction, and the general proficiency shown. If the report is favorable, the name of the school is entered on the published list of High Schools, accredited by the University. The graduates of these schools are admitted to any of the colleges for which their studies may have prepared them. The appointment continues as long as the work of the school is found satisfactory.

ACCREDITED HIGH SCHOOLS.

Princeton High School.....	H. L. Boltwood, Principal.
Lake View High School.....	A. T. Nightingale, “
Champaign, West High School.....	T. L. Evans, “
Tolono High School.....	O. C. Palmer, “
Decatur High School.....	E. A. Gastman, “
Salem High School.....	N. S. Scovell, “
Champaign, East Side School.....	Eugene DeBurn, “
Urbana High School.....	J. W. Hayes, “
Elmwood High School.....	J. M. Crow, “

N. B.—Schools desiring to be placed on either of these lists will be furnished, on application, with the circular of instructions.



COLLEGE OF AGRICULTURE.

SPECIAL FACULTY.

THE REGENT,

PROFESSOR MORROW, Dean.		DOCTOR F.W. PRENTICE,
PROFESSOR BURRILL,		C. I. HAYS,
M. A. SCOVELL.		

SCHOOLS.

SCHOOL OF AGRICULTURE.

SCHOOL OF HORTICULTURE.

ADMISSION.

Candidates for admission to the College of Agriculture must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches, and in the studies of the preliminary year. While by law, students may be admitted at fifteen years of age, in general it is much better that they shall be eighteen or twenty. It will be well if candidates shall have pursued other studies besides those required for admission. The better the preparation the more profitable the course. Some knowledge of the Latin Language will especially aid in the Scientific Studies.

SCHOOL OF AGRICULTURE.

OBJECT OF THE SCHOOL.

The aim of this school is to educate scientific agriculturists. The frequency with which this aim is misunderstood, demands that it shall be fully explained. Many, who look upon agriculture as consisting merely in the manual work of plowing, planting, cultivating, and harvesting and in the care of stock, justly ridicule the

idea of teaching these arts in a college. The practical farmer who has spent his life in farm labors, laughs at the notion of sending his son to learn these from a set of scientific professors. But all this implies a gross misunderstanding of the real object of agricultural science. It is not simply to teach *how* to plow, but the reason for plowing at all—to teach the composition and nature of soils, the philosophy of plowing, of manures, and the adaptation of the different soils to different crops and cultures. It is not simply to teach *how* to feed, but to show the composition, action and value of the several kinds of food, and the laws of feeding, fattening, and healthful growth. In short, it is the aim of the true Agricultural College to enable the student to understand thoroughly, all that man can know about soils and seeds, plants and animals, and the influences of light, heat and moisture on his fields, his crops, and his stock; so that he may both understand the reason of the processes he uses, and may intelligently work for the improvement of those processes. Not “book farming,” but a knowledge of the real nature of all true farming—of the great natural laws of the farm and its phenomena—this is the true aim of agricultural education. Agriculture involves a larger number of sciences than any other human employment and cannot be regarded as an unfit end of a sound collegiate training.

The steady aim of the trustees has been to give to the College of Agriculture the largest development practicable, and to meet the full demand for Agricultural education, as fast as it shall arise. Agricultural students are especially invited to the University.

Boards of Agriculture, and Agricultural Associations, State and County, are invited to co-operate with the University in its efforts to awaken a more general appreciation of the value of education, and to add, by the establishment of scholarships or other means, to the number of those who avail themselves of its facilities for instruction.

INSTRUCTION.

The instruction unites, as far as possible, theory and practice—theory explaining practice and practice illustrating theory. The technical studies are mainly taught by lectures, with careful readings of standard agricultural books and periodicals, and frequent discussions, oral and written, by the students, of the principles taught. These are also illustrated by demonstrations and observations in the fields and stables, not only of the University, but of leading farmers and stock-growers in the vicinity.

TECHNICAL STUDIES.

Elements of Agriculture.—Outline of the general principles underlying Agriculture in its theory and practice, introductory to the other technical and scientific studies of the course.

Agricultural Engineering and Architecture.—Arrangement of the Farm ; its improvement by mechanical means, as Drainage and Irrigation ; its divisions, fences, hedges, etc. ; its water supply ; the construction of Roads ; arrangement, planning and construction of Farm Buildings ; the construction, selection, care, and use of Farm Implements and Machinery.

Animal Husbandry.—Principles of breeding and management of our domestic animals ; description of all important breeds and varieties, giving their history and adaptations.

Rural Economy.—Relations of agriculture to other industries and to national prosperity ; influences which should determine the class of farming to be adopted ; comparisons of special and general systems ; uniting of manufacturing with farming ; culture of the various farm crops—cereals, grasses, etc.

History of Agriculture.—Progress and present condition in this and other countries. Influence of climate, Civilization and Legislation in advancing or retarding. Agricultural Literature and Organizations.

Rural Law.—Business Law ; Laws especially affecting Agriculture—tenures of Real Estate ; Road, Fence, Drainage Laws etc.

Laboratory Work.—Experiments and Special Investigations by each student. A *Thesis* is required embodying the results of this work.

For details as to the study of Botany, Chemistry, Zoology, Entomology, Geology and Meteorology, see statements in College of Natural Science.

VETERINARY SCIENCE.

In Veterinary Science the lectures are given by a graduate of the schools of veterinary science in both Edinburgh and London. This science is taught during the third year. In the first term the Anatomy and Physiology of the Domestic Animals is taught by lectures, demonstrations and dissections. Post-mortems of healthy and diseased animals are made, so that the student may become practically acquainted with the tissues in health and in disease. The first six weeks of the second term are devoted to the study of Veterinary Medicines, their action and uses ; the remainder of the term to lectures on the Principles and Practice of Vet-

erinary Science. During the third term, practical instruction is given in clinical work, as cases present themselves, at the veterinary infirmary, where animals are treated or operated on free of charge, for the instruction of the students. Lectures are also given on Veterinary Sanitary Science and the Principles and Practice of Veterinary Surgery.

Students desiring to pursue the study of Veterinary Science, further than is laid down in the Agricultural course will find ample facilities for so doing.

Text Books and Books of Reference.—Williams' Principles and Practice of Veterinary Medicine; Williams' Principles and Practice of Veterinary Surgery. Veterinary Medicines; their Action and Uses, by Findlay Dun; Dobson on the Diseases of the Ox; Fleming's Veterinary Obstetrics; Fleming's Veterinary Sanitary Science; Chauveau's Anatomy of the Domestic Animals; Law's Farmer's Veterinary Adviser.

APPARATUS.

The College has for the illustration of practical agriculture, a Stock Farm of 410 acres, provided with a large stock barn fitted up with stables, pens, yards, etc.; also an Experimental Farm of 180 acres, thoroughly furnished with all necessary apparatus. It has also fine specimens of neat cattle, Short-Horns and Jerseys. Also several breeds of swine, to illustrate the problems of breeding and feeding. The Experimental Department exhibits field experiments, in the testing of the different varieties and modes of culture of field crops, and in the comparison and treatment of soils. It includes also experiments in agriculture and horticulture, under the direction of the Professors of Agriculture and of Horticulture and of the Farm Superintendent, and experiments in feeding animals of different ages and development, upon the various kinds of food. In common with similar departments in the several State Agricultural Colleges of the country, it attempts to create positive knowledge towards the development of an agricultural science.

The Barn on the Stock Farm has north and west fronts of 80 feet each. Each limb, or L, is 40 feet wide. It is of the kind known as the side-hill barn. The Barn on the Experimental Farm is of less size, but is fitted up with great convenience, and is supplied with a mill for grinding feed, run by a large wind-mill.

A Veterinary Hall and Stable has been provided, and a Clinic is held to illustrate the lectures on Veterinary Science.

The department has *papier-mache* models of the foot and teeth of the horse at different ages. Dr. Auzoux' celebrated complete model of the horse in 97 pieces, and exhibiting 3,000 details of structure, has just been received from Paris.

Surveying and Drainage are illustrated by field practice, with instruments, and by models. Agricultural Chemistry is pursued in connection with laboratory practice, in the analysis of soils, fertilizers, foods, etc. The College also has fine collections of soils, seeds, plants, implements, skeletons of domestic animals, plants, charts, and other apparatus, including a large number of models of agricultural machinery from the Patent Office.

AGRICULTURAL COURSE.

Required for the Degree of B. S. in School of Agriculture.

FIRST YEAR.

1. Elements of Agriculture and Horticulture, Chemistry, Trigonometry and Adv. Geometry.
2. Chemistry, American Authors, Free Hand Drawing.
3. Vegetable Physiology, Chemistry, Rhetoric.

SECOND YEAR.

1. Agricultural Chemistry, (Soils and Plants), Botany, German.
2. Agricultural Chemistry (Tillage, Fertilizers, Foods), Botany, German.
3. Economic Entomology, Zoology, German.

THIRD YEAR.

1. Agricultural Engineering and Architecture, Animal Anatomy and Physiology, Geology or Ancient History.
2. Animal Husbandry, Veterinary Science, Physics or Mediæval History.
3. Landscape Gardening, Veterinary Science, Physics or Modern History.

FOURTH YEAR.

1. Meteorology and Physical Geography, or Pomology and Forestry, Mental Science, History of Civilization.
2. Rural Economy, Constitutional History, Logic.
3. History of Agriculture and Rural Law, Political Economy, Laboratory Work, Graduating Thesis.

FARMER'S COURSE.

To meet the wants of young farmers or others who cannot give the time necessary for the full course, and yet desire to better fit themselves to be successful farmers, a special course has been arranged, in which the student gives exclusive attention to the

technical Agricultural studies, including Veterinary Science, and completes these in one year. The studies of the second or winter term of this course are arranged so as to be profitably studied by those who can be in attendance only during that term. Students will be admitted to this course on passing a satisfactory examination in the common school branches, but they will receive greater benefit from it if they have made better preparation, especially if they have a good knowledge of Botany and Chemistry. They should not be less than eighteen years of age. The studies in this course are arranged in the following order :

1. Elements of Agriculture, Agricultural Engineering and Architecture, Animal Anatomy and Physiology.
2. Animal Husbandry, Rural Economy, Veterinary Science.
3. History of Agriculture and Rural Law, Veterinary Science, Practical Entomology or Landscape Gardening.

SCHOOL OF HORTICULTURE.

OBJECT OF THE SCHOOL.

The aim of this school is to afford a scientific and practical education specially adapted to the wants of those who cultivate garden and orchard plants, or wish to manage nurseries, parks and pleasure grounds.

INSTRUCTION.

The instruction is both theoretical and practical. The classroom recitations and lectures are supplemented by practice in the fields and plant-houses. The course recommended for those intending to prepare for the duties of the practical horticulturist, is given below.

At the end of the course a Thesis is required upon some subject connected with Horticultural Science or pursuits. This must be the record of original experiment or research, with appropriate deductions. Suitable illustrations are to accompany the paper. All Theses will be deposited in the library of the University.

APPARATUS.

Ample provision is made for the illustration of the subjects taught. The cabinet contains among other things: a series of colored plaster-casts of fruits prepared at the University; *modeles clastiques* of fruits and flowers by Auzoux of Paris; collections of

seeds of native and exotic plants; of specimens of native and foreign woods; of beneficial and injurious insects, and specimens showing their work; numerous dry and alcoholic specimens and preparations; maps, charts, diagrams, drawings, etc.

The school is well supplied with compound microscopes and apparatus, and students have abundant opportunity to learn their use, and to make practical investigations with them. The herbarium is rich in specimens of useful and noxious plants, including many of the fungous parasites which cause disease to cultivated crops.

Upon the grounds devoted to the use of the school, there are :
1. A very large specimen apple orchard planted in 1869, and containing above 1000 varieties,—many varieties of pears, cherries, grapes and small fruits. 2. A nursery of young trees, in which students have regular work in propagation, etc. 3. A forest-tree plantation embracing the most useful kinds of timber. 4. An arboretum in which all hardy indigenous and exotic trees are planted as fast as they can be secured, and now containing nearly 100 varieties. The ornamental grounds which surround the University building, embrace about twenty acres, and are kept in neat and attractive style. These, with all the adjuncts of trees and flowering shrubs, lawn and beds of flowers and foliage plants, walks of different material and styles of laying out, give illustration to the class-room work in landscape gardening. A spacious green-house, much enlarged the past year, contains a collection of plants of great value for the classes in floriculture and landscape gardening, besides furnishing students with practice in hot-house and green-house management. The library contains the best literature upon these subjects.

TECHNICAL STUDIES.

Elements of Horticulture.—This study is an introduction to the subjects which are presented in a comprehensive manner afterward, and gives the most possible information in regard to cultivated trees, fruits, vegetables, and flowers, in the time devoted to it. The instruction is mainly by lectures illustrated by specimens and drawings. The following topics are discussed: Orchard Sites, the Age of Trees to Plant, the Season to Plant, How to Plant, What to Plant, the Management of the Soil, Pruning and Care of Trees, Gathering and Preserving Fruit, Diseases and Injuries, the Nursery, Ornamental Trees and Shrubs, Flower Gardens, Vegetable Gardens, including Propagating Beds and

Houses, the Vineyard and Small Fruits, and Timber Tree Plantations. • Students have instruction and practice in grafting, budding, propagation by cuttings, etc. Each student has usually grafted from two hundred to one thousand root-grafts of apples.

Pomology and Forestry are studied fourteen weeks. Much of the first half of the term is spent in the orchards, nurseries, and forests, making observations and collections, and in laboratory work, determining species, varieties, etc. A large collection of apples, pears, grapes, peaches, etc., is made each year, and the chief characteristics of each pointed out. Practice is also had in making drawings and plaster casts. Written descriptions of the fruits are carefully made and compared with those given in the books, and systems of analysis and classification put to practical test. Students see and perform the skilled operations usually practiced in the propagation and growth of trees.

Pruning and training by various methods, especially of grapes, are discussed in the class-room, and illustrated upon the grounds.

Students also study the injurious insects and fungi which cause or accompany diseases of trees and fruits, and the methods of preventing or diminishing their ravages.

The native forests of the vicinity and of the country at large are studied as a foundation for the lessons upon the influence and value of timber and other trees, and their artificial culture. For the latter, the forest tree plantation on the University grounds, and the arboretum, afford practical illustration.

Downing's "Fruits and Fruit Trees of America"; Warder's "Pomology"; Thomas' "Fruit Culturist"; Grigor's "Arboriculture"; Brown's "The Forester"; and Bryant's "Forest Tree Culturist," are important books of reference.

Plant Houses and Management.—This study includes garden and landscape architecture, the methods of construction, heating and ventilation and general management, so as to secure, under the different circumstances, the best plant growth. The class-room work consists of lectures and architectural designing and drawing. Illustration and practice are afforded by the plant-houses of the University.

Landscape Gardening.—Eleven week's are devoted to this study. Lectures are given upon the general principles of the art, the history and styles, the kinds and uses of trees, shrubs, grass and flowers, the introduction and management of water, the construction and laying out of drives and walks, fences, buildings, etc. The class draw first from copy, then, after the actual study of

some locality with its environments, design and draw full plans for its improvement, indicating position of all prominent objects, including the kinds and groups of trees and other plants. These plans with specifications, are to be deposited in the library of the school. Excursions are made when found practicable for the study of public and private grounds.

Important reference books are: Downing's "Landscape Gardening"; Weideman's "Beautifying Country Homes"; Robinson's "Parks, Promenades and Gardens of Paris."

Floriculture.—Fourteen weeks are occupied in the study of the kinds, propagation, growth and care of flowering and other ornamental plants. Each student has practice in propagating by cuttings and otherwise, in potting and shifting, and care of plants requiring various treatments. Insects and diseases with the remedies are thoroughly treated, and the means of securing vigor of growth, or abundance of flowers, are studied and illustrated by practice.

Among the reference books the following are important: Henderson's "Practical Floriculture"; Loudon's "Encyclopedia of Plants"; Parkman's "Book of Roses."

For statement of studies in *Botany* and *Entomology* and for *Microscopy and Fungology*, see School of Natural History.

For *Agricultural Chemistry*, see School of Chemistry.

Horticultural History and Rural Law.—Ten weeks: This term's study nearly corresponds with that for the same time in the Agricultural course, and when alike the two classes are made one. Students of this course have special study of the history and literature of Horticulture, so far as these are distinct from that of Agriculture.

All Theses and other required manuscripts in the College of Agriculture must be on regulation paper, of the size of $8 \times 11 \frac{1}{2}$ inches.

HORTICULTURAL COURSE.

Required for Degree of B. S. in School of Horticulture.

FIRST YEAR.

1. Elements of Horticulture and Agriculture, Chemistry, Trigonometry and Adv. Geometry.
2. Chemistry, Free Hand Drawing, American Authors.
3. Vegetable Physiology, Chemistry, Rhetoric.

SECOND YEAR.

1. Botany, Agricultural Chemistry (Soils and Plants), German.
2. Botany, Agricultural Chemistry (Tillage and Fertilizers), German.
3. Economic Entomology, Zoology, German.

THIRD YEAR.

1. Pomology and Forestry, Architecture and Engineering, Geology or Ancient History.
2. Plant-houses and Management, Physics, Mediæval History.
3. Landscape Gardening, Physics, Modern History.

FOURTH YEAR.

1. Floriculture, Meteorology and Physical Geography, Mental Science.
2. Microscopy and Fungology, Constitutional History, Logic.
3. Horticultural History and Rural Law, Political Economy, Laboratory Work, Graduating Thesis.



COLLEGE OF ENGINEERING.

SPECIAL FACULTY,

THE REGENT,

PROFESSOR RICKER, Dean.	PROFESSOR WEBER,
PROFESSOR SHATTUCK,	I. O. BAKER,
PROFESSOR WEBB,	PROFESSOR BAUMGRAS,
PROFESSOR PEABODY,	C. W. CLARK,
J. C. LEWELLIN.	

SCHOOLS.

MECHANICAL ENGINEERING,	CIVIL ENGINEERING,
MINING ENGINEERING,	ARCHITECTURE.

ADMISSION.

Applicants should be at least eighteen years of age. None are admitted under fifteen. The requirements for admission embrace the common school branches and the studies of the preliminary year. The examinations in Mathematics are especially thorough.

Those who make further preparations than that required before entering, can make their courses more extensive and profitable. The following suggestions are offered to such as wish to make thorough work: French and German, are pursued at least one year each. Some preparation in Latin will be of great assistance in these languages. The engineer and architect should be adepts in the various departments of drawing, and some previous study of this branch will be of great advantage; "Warren's Draughting Instruments" may be used as a text-book, and the drawings made on smooth paper, eight by ten inches.

REGULATION PAPER.

The following sizes and qualities of paper will be required in all the College Exercises:

For manuscript and unimportant drawings, a heavy flat-cap paper. For ordinary drawings, not colored, a heavy, first quality, smooth drawing paper. For drawings finished in colors, the best Whatman's paper. For topographical and right-line drawings, and lettering, the best three-sheet Bristol board.

SIZES.

For Problems, Exercises, Vacation Journals, Lecture Notes, Theses and other Manuscripts, and for Geometrical Projection, Topographical, Railroad, Typographical and Construction Drawings, paper $8 \times 11 \frac{1}{2}$ inches, the size of the plate being 8×10 with $\frac{1}{2}$ added for binding. If Bristol board is used it must be cut 8×10 inches, and the binding margin hinged on with muslin.

CONTRIBUTIONS.

Our friends and students are invited to send us specimens of material and manufactures, and drawings, models or photographs of machinery, bridges, and other engineering and architectural works. Finished and detailed working drawings, perhaps otherwise useless, may be of great value for instruction. Illustrated circulars and price lists of manufacturing firms are desired. Contributions will be labeled with the donors' names and placed in the cabinets of the College for the inspection of students, and the illustration of lectures.

SPECIAL EXERCISES, VACATION JOURNALS, AND MEMOIRS.

During the second and third vacations, Journals are required to be kept by each student of the College, to be presented at the opening of the winter term, and read before the faculty and students of the College, in evening sessions.

The Journal should consist of illustrated descriptions of engineering and architectural subjects: such as important steam engines; water and gas works, mines and mining machinery. Special methods in use of government and land surveys, make-up of parties; plans and ornamentation of important buildings; architectural style and details, stability, economy and novelty of construction of roof trusses, arches, bridges, canals and reservoirs, peculiar instruments, machinery for spinning metals, making gas pipes, saws, etc.

THESES.

In all the schools of this College a Thesis is required as a condition of graduation. It must be an original composition of suitable length, upon a subject appropriate to the school, and approved by the Professor in charge. The student must be prepared to explain and defend it before his class. It must be illustrated with such photographs, drawings and sketches as may be needed, and embellished with a title page neatly designed and printed with India ink, or colors. It must be upon Regulation Paper and securely bound. It will be prepared during the latter part of the fourth year and presented at the close of the course, after which it will be deposited in the Library of the University.

The Vacation Journals will be preserved in the cabinets of the respective schools for future reference. These papers, and also the practical exercises mentioned in each course, will be credited upon the diploma, and no course of the College will be accounted complete without them.

SCHOOL OF MECHANICAL ENGINEERING.

OBJECT OF THE SCHOOL.

This school seeks to prepare students for the Profession of Mechanical Engineering. It aims to fit them to invent, design, construct and manage machinery for any branch of manufactures. The State needs men who, to a thorough knowledge of the principles of machinery and of the various motors, add the practical skill necessary to design and construct the machines by which these motors are made to do work.

INSTRUCTION.

The instruction, while severely scientific, is thoroughly practical. It aims at a clear understanding and mastery of all mechanical principles and devices. Practice in the Mechanical Laboratory, is counted as one of the studies of the course.

In PRINCIPLES, instruction is imparted by lectures, illustrated plates and by text books. Examples are also given, showing the application of the theories and principles taught. Experiments in the testing of machines and motors are undertaken by the student.

In PRACTICE, elementary forms are produced and Projects are executed, in which the student constructs machines, or parts

thereof, of his own designing, and from his own working drawings.

In DESIGNING, the student begins with elements, and proceeds with progressive exercises till he is able to design and represent complete machines.

INSTRUCTION IN MECHANICAL ART AND DESIGN.

An elementary course of shop practice has been carefully arranged, the object of which is to familiarize the student with the forms of the parts of machines, and the mode of producing them. He is made familiar with all the ordinary cutting tools for iron and wood; the form and condition for most effective work; the machines and appliances by which they are put into action, and the instruments by which desired dimensions of product are obtained. This practice is carried on in the Mechanical Laboratory, and represents five different shops, viz :

1—PATTERN MAKING.

2—BLACKSMITHING.

3—MOULDING AND FOUNDING.

4—BENCH WORK FOR IRON.

5—MACHINE TOOL WORK FOR IRON.

In the 1st, the practice consists of planing, turning, chiseling, etc., in producing true surfaces of various forms in wood, and also of combining pieces by glue joint, etc., preliminary to correct pattern making. Patterns are finally made from which are cast pieces in iron, brass, etc., to be worked in the subsequent shops.

In the 2d, the student uses the forge and performs the various elementary operations, such as drawing, upsetting, bending, welding, etc.

In the 3d, several pieces are moulded in sand and cast, some of which are useful in the succeeding shops.

In the 4th, there is first a course of free-hand bench work, where the cold-chisel and file are the only tools. After the hand and eye are sufficiently trained, fitting is begun, and the square, bevel, rule, compasses and other auxiliary bench tools are used. Pieces are then fitted together by the file, with surfaces carefully finished.

The 5th shop involves the use of the ordinary machine tools of the machine shop. The first practice employs these machines with their cutting tools or bits, in the common operations, such as turning cylinders, disks, grooves and fillets; boring, drilling, hand-turning, milling, planing, etc. Following this is a course of practice in fitting and finishing, in which calipers, rules, etc., are introduced, and many of the various fittings employed in machinery are produced. Polishing and finishing of surfaces are also practiced.

Lectures are given in which the most favorable forms and manipulation of cutting tools and auxiliary appliances are explained.

Previous to the shop work, the pieces are drawn by the student, and the exact thing to be done is indicated, thus avoiding mistakes, and facilitating practice.

The designing of such machine elements as pulleys, journal boxes, cranks, stuffing boxes, etc., cultivates a knowledge of proportion, and of its proper representation on paper. This practice in designing and drawing is a leading feature in the course of instruction.

This course of elementary practice fits the student for the advanced shop practice in designing and construction of complete machines undertaken later in the course.

STUDIES.

The studies are given by the year and term in the tabular view of the course. The order there indicated should be closely followed, that the student may avoid interference of his hours of recitation. The following is a detailed view :

PURE MATHEMATICS.

Advanced Geometry.—Applications of Algebra to Geometry; Transversals; Harmonic Proportions, etc. *Trigonometry.*—Analytical and Plane. Relations between the functions of an arc; Formation and use of Tables; Solution of plane triangles. *Analytical Geometry.*—Construction of equations; Discussion, in a plane, of the point, right-line, circle, ellipse, parabola and hyperbola; Higher plane curves, cycloid, cissoid of Diocles, etc.—*Differential Calculus.*—Differentials of algebraic and transcendental functions; Maclaurin's Theorem; Taylor's Theorem; Maxima and Minima of functions of one variable; Equations of tangents, normals, sub-tangents, sub-normals, etc.; Differentials of

lines, surfaces of volumes. *Integral Calculus*.—Integration of elementary forms and of rational fractions ; Rectification of plane curves ; Quadrature of plane areas and surfaces of revolution ; and Cubature of solids of revolution.

SECOND YEAR.

Advanced Algebra.—Binomial Theorem ; Properties and summation of series. Exponential quantities, Logarithms. General theory and methods of solving equations. *Analytical Geometry*.—Loci in space ; Surfaces of the second order. *Differential Calculus*.—Differentials and Maxima and Minima of functions of two or more variables ; Osculatory curves ; Radius of curvature ; Evolutes, involutes and envelopes ; Discussion of algebraic and transcendental curves and surfaces ; Tangent and normal planes ; Partial differentials of surfaces and volumes. *Integral Calculus*.—Integration of transcendental and irrational differentials ; Differentials of higher orders ; Differential equations ; Rectifications, quadrature and cubature in general. *Spherical Trigonometry*.—General Formulas ; Solution of Spherical Triangles. *Calculus of Variations* will be taught to advanced students.

PHYSICS.

The course in Physics is complete and thorough, embracing the four kinds of work following :

1. Recitations, five exercises a week, in which a text book is used as a guide.
2. Experiments in Physical Laboratory one day each week, in which the student uses the instruments in testing the principles taught.
3. Illustrated experiments once each week, in which the more costly apparatus is used before the whole class, in such experiments as are difficult to perform, and which are most effective when prepared for an audience.
4. Higher physical experiments by advanced classes, consisting either of researches, or of reviews of careful and elaborate experiments previously worked up by others.

The department of Physics is amply provided with illustrative apparatus for use in the lecture room, and an extensive Physical Laboratory. The collection of instruments, costing over \$5,000, embraces Acoustic apparatus from R. Koenig, of Paris ; apparatus for Heat and Molecular physics from J. Salleron, of Paris ; for

Light, Optics and Electricity from Stoeherer, of Leipsic. and Browning and Newton, of London; Pneumatic and Electrical apparatus from E. S. Ritchie, of Boston; and a large number of pieces prepared at the Mechanical Shops of the University. It includes, also, Browning's Electric Lamp; and from Eliot Bros., London, Resistance Coils, Galvanometers, etc., for higher researches in Electricity.

TECHNICAL STUDIES.

Cinematics, and Principles of Mechanism.—Relative Motion of points in a system of connected pieces; Motion independent of Force; Velocity ratio; Investigation of motion of elementary parts of machines, as Friction and Noncircular Wheels in rolling contact, Cams and Curves in sliding contact; Correct-working Gear Teeth; Gearing Chains; Escapements; Link-Work.

Analytical Mechanics.—Equations of Equilibrium; Moments; Virtual Velocities; Centers of Gravity; Mechanical Powers; Friction; Dynamics.

Hydraulics.—Amount and Center of Pressure upon submerged surfaces; Flow of Liquids through Orifices, Weirs, Pipes and Channels; Distribution of water in cities. Forms and arrangement of orifices for fountains.

Thermodynamics.—The Laws and complete Theory of Thermodynamics as required in the study of all kinds of heat engines, including the department of perfect gases during expansion, and also steam and other fluids not perfect gases; action of heat in changes of state, and in confined fluids.

Resistance of Materials.—See School of Civil Engineering.

Prime Movers.—The theory and useful effects of Turbine Water-wheels, and best form of the parts for high efficiency. Other Water-wheels and Wind-wheels. Application of Thermodynamics in the study of Heat Engines. Relative Economy of different engines.

Mill-work and Machinery—Trains of Mechanism, studied with reference to their Resistance and Efficiency. Best forms for transmission of power for short and great distances. Forms of the parts for securing desired results in power and velocity; Elastic and ultimate strength of parts.

DRAWING.

Projection Drawing.—Use of Instruments in applying the Elements of Descriptive Geometry; Use of Water Colors; Isometrical Drawing; Shades and Shadows; Perspective.

Free-Hand Drawing.—Sketches of Machinery ; Ornamentation ; Lettering.

Machine Drawing.—Working Drawings of Original Designs ; Finishing in Water Colors, and in Line-shading ; Details for Shop Use according to the practice of leading manufacturers.

PROJECTS AND PRACTICE.

The Shop Practice of the first year has already been described. The second year practice will have for its object the production of some model or machine. The students under the immediate direction of teachers, carefully determine the dimensions and shapes best suited for the parts of some machine, reduce them to neat and accurate working drawings and make tracings for shop use. No student will commence his advanced shop practice without working drawings. The designs are such as require executions in iron, brass and wood, for the purpose of giving breadth of practice. The student is required to make the patterns and castings, finish the parts, and put them together in accordance with the working drawings and the required standard of workmanship. This acquaints him with the manner in which the Mechanical Engineer carries his designs into execution, and teaches him to so shape, proportion and dispose the parts of a machine as to secure the greatest economy of construction and durability in use. The practice of the third year will include the careful construction of mechanical movements, strictly in accordance with the theoretical determination of the form of the parts.

Besides these practical exercises, students of sufficient skill may be employed in the Commercial work which is undertaken by the shop. For this work they receive compensation. This work includes all kinds of machine building and repairing, and will serve to extend and confirm the practical experience of the student.

Experiments and Practical Problems.—Experiments in the testing of Prime Movers and other machines, are undertaken by each student. They take Indicator Diagrams from the engine of the Mechanical Laboratory and in factories in the adjoining towns, and determine from them the power developed with different degrees of expansion, and the defects of valve movement in distribution of steam.

In strength of materials the student determines the modulus of rupture and coefficient of elasticity of about six kinds of building material. In Hydraulics the flow of water through orifices of

different form are studied experimentally. In Mechanism each student works out and reports on an original problem involving mechanical movements.

APPARATUS.

This school is provided with plates and a cabinet of models illustrating mechanical movements and elementary combinations of mechanism. This collection is rapidly increasing by our own manufacture, and by purchase from abroad. It includes many of Riggs' models, and others from the celebrated manufactory of J. Schröder, of Darmstadt, Germany. About two hundred valuable models from the United States Patent Office are also included in the cabinet.

The State has provided a large Mechanical Laboratory and Workshop.

The Pattern Shop is furnished with complete sets of tools, benches and vises for Pattern-makers. In a separate building are forges, a moulder's bench with sand, and brass and iron furnaces sufficient for the castings ordinarily required. Additional sets of tools are provided for the special use of students in the shop-practice classes.

MECHANICAL ENGINEERING COURSE.

Required for Degree of B. S. in School of Mechanical Engineering.

FIRST YEAR.

1. Plane Trigonometry and Advanced Geometry; Projection Drawing; French.
2. Analytical Geometry; Descriptive Geometry and Lettering; Shop Practice; French.
3. Calculus; Free Hand Drawing; Shop Practice; French.

SECOND YEAR.

1. Designing and Construction of Machines; Advanced Algebra and Analytical Geometry; German.
2. Advanced Calculus; Designing and Construction of Machines; German.
3. Advanced Calculus; Astronomy; German.

THIRD YEAR.

1. Mechanism and Mechanical Laboratory; Advanced Descriptive Geometry; Chemistry and Laboratory Practice.
2. Analytical Mechanics and Mechanical Laboratory; Chemistry and Laboratory Practice; Physics.
3. Analytical Mechanics; Modern History; Physics.

FOURTH YEAR.

1. Resistance of Materials and Hydraulics ; Geology ; Mental Science.
 2. Prime Movers ; Constitutional History ; Construction Drawing.
 3. Mill Work ; Designing and Laboratory Practice ; Political Economy ;
Graduating Thesis
-

SCHOOL OF CIVIL ENGINEERING.

OBJECT OF THE SCHOOL.

The School is designed to furnish a course of theoretical instruction, accompanied and illustrated by a large amount of practice, which will enable students to enter intelligently upon the various and important duties of the Engineer.

INSTRUCTION.

The student should lay a broad foundation in general culture, which will enable him to pursue his professional studies with greater ease and advantage. With this view, the subjects peculiar to Civil Engineering are not introduced until the second year.

The instruction is given by lectures, text-books and reading, to which are added numerous problems and practical exercises, as serving best to completely explain subjects and fix them in the mind. Models and instruments are continually used, both in lectures and by the students themselves.

COURSE OF STUDIES.

The complete Course occupies four years. The tabular view shows the arrangement of the subjects. The studies of the first three years will prepare students for undertaking many engineering operations, such as the building of railroads, canals, embankments, etc. The fourth year is intended to fit them for the higher engineering constructions, as the building of arches, trussed bridges, and supporting frames of all kinds.

Each year consists of thirty-six working weeks, divided into Fall, Winter and Spring Terms. The four years are divided among the different branches nearly as follows : Languages, 360 recitations ; Pure Mathematics, 369 recitations ; Drawing of all kinds, 840 hours ; Lectures with Mathematical Analysis, 100 hours ; Surveying, recitations, drawing and field practice, 200 hours ; Physics, Mechanics, Hydraulics, Astronomy, Geology,

Chemistry, Mental Philosophy, Logic, Political Economy, History, altogether 680 lectures, recitations, and exercises; Practice in the Chemical Laboratory, 110 hours; Engineering Projects, 240 hours. Besides the above, there are various special exercises requiring time, the amount of which cannot be assigned. Each recitation requires one hour in the class-room, and to its preparation should be given an average time of three hours.

TECHNICAL STUDIES.

Mathematics.—For a list of the principal subjects included under Pure Mathematics, see the school of Mechanical Engineering.

The following are those included in Applied Mathematics: *Descriptive Geometry.*—Problems on the Point, Right Line and Plane; Warped Surfaces; Perspective; Shades and Shadows; Practical Problems.

Analytical Mechanics and Hydraulics.—See School of Mechanical Engineering.

Astronomy.—The Observatory; Instruments and their adjustments; Determination of time, latitude and longitude; Practical exercises.

Geodesy.—Figure of the Earth; Surveys of the Earth's Surface; Base Lines; Parallels and Meridians; Methods of the United States Surveys; Barometric Measurements.

Land Surveying.—Areas; Distances; Omissions and Corrections; Standard Units; Metrical System; Refraction; Curvature of the Earth; Theories of Surveying Instruments; Adjustment of Instruments.

R. R. Surveying.—Curves; Turnouts; Crossings; Obstructions; Slope Stakes; Earth-work; Grades; Curvature of Rails; Coning of Wheels; Calculation and use of Tables.

DRAWING.

Projection Drawing.—Use of Instruments in applying the Elements of Descriptive Geometry; Use of Water Colors; Isometrical Drawing; Shades, Shadows and Perspective; Drawings finished in colors and by right-line shading; Bridges; Right and Oblique Arches. *Free-Hand*—Landscapes; Buildings; Lettering and Ornamental Work. *Topographical*—Sketching; Ink Drawings; Conventional Signs, etc. *Mapping*—Railroad and City and County Maps. *Architectural*—Designing and Drawing of Engineering Structures.

NATURAL SCIENCE.

Physics.—See School of Mechanical Engineering. *Chemistry*—Inorganic Chemistry and Qualitative Analysis. *Geology*—Elements of Physiographic, Lithological, Historical and Dynamical Geology.

ASTRONOMY AND GEODESY.

Descriptive Astronomy is given by lectures with a text-book. The Equatorial Telescope is in constant use during the favorable weather. *Practical Astronomy* is given by lectures and practical work with the Meridian Circle, Sextant, Theodolite, and Engineer's Transits adapted to Astronomical work; and by Astronomical calculations. *Geodesy* is given by lectures, practice and calculation.

ENGINEERING.

Road Engineering.—Location and Construction of Roads and Railroads; Grades; Gauges; Tunnels, etc. *Resistance of Materials*—Elasticity; Safe Limits; Shearing Stress; Flexure and Strength of Beams and Columns; Practical Formulæ. *Trusses*—Analysis of a variety of Roofs and Frames, with methods of obtaining the strains. *Bridge Construction*—Warren's, Howe's, and other Trusses; Tubular and Suspension Bridges; Arches, etc. *Stone Work*—Stone; Limes and Mortars; Foundations, etc.

PROJECTS.

During the Spring Term of the second year, an accurate Topographical Survey of a locality is made by the class, and instruction given in the use of the Level, preparatory to a project in Railroad Engineering, which is executed in the Fall Term of the next year. The Plane-table is used as in the U. S. Surveys.

The Project consists of a Preliminary Survey, Locations, Drawings and Estimates.

The Preliminary Survey will consist in an examination of the locality, and in running tangent lines, with leveling and topographical sketching.

The Location will consist in running the line over the route decided upon, with all the necessary measurements and calculations for establishing the grade, setting slope stakes, determining

the amount of earthwork, designing the buildings, bridges, culverts, etc.

The Drawings will include Alignment, Profile, Plans, and Sections.

The estimates will give the cost of ground, earthwork structures, rolling stock, etc.

A project in Geodesy, or Higher Engineering, will be executed during the Senior year.

APPARATUS.

The School is provided with both English and American Instruments for the different branches of Engineering Practice, and for the Astronomical work of Higher Surveying. It has numerous models for illustration of its specialties, and access to the cabinets of the other Schools. To facilitate the practice in Trigonometrical and Land Surveying, it has a specially prepared area, in which the difficulties of plane surveying are presented to the beginner as he is able to meet them, and where he is taught practical methods of overcoming them. This area is subdivided by a large number of lines, the positions of which are accurately known, but not by the student. He is then required to determine the position of the "corners" by various methods, and to calculate the enclosed areas. Other problems are given in determining inaccessible distances, passing obstacles, avoiding local attractions, etc., for which the ground is prepared. The number of divisions is so large that no two students need have the same problem, and so accurately laid out that the correctness of the student's work can at once be determined.

An Astronomical Observatory for meridian observations, and of suitable size for the practical exercises in Astronomy, has been erected and is in use. An Equatorial telescope has also been mounted for the use of the students. A set of Smithsonian Meteorological instruments has been procured, placed in suitable positions, and observations commenced. A Universal Instrument for Astronomical and Geodetic work is being made for the use of the Senior classes, by Messrs. Ertel & Son, Munich. It will read to seconds of arc both in altitude and azimuth by four micrometers, and will in all respects be a superior instrument, adapted to the most accurate work.

CIVIL ENGINEERING COURSE.

Required for Degree of B. S. in School of Civil Engineering.

FIRST YEAR.

1. Plane Trigonometry and Advanced Geometry ; Projection Drawing ; French.
2. Analytical Geometry ; Descriptive Geometry and Lettering ; French.
3. Calculus ; Free-Hand Drawing ; French.

SECOND YEAR.

1. Advanced Algebra and Analytical Geometry ; Land Surveying ; German.
2. Advanced Calculus ; Right Line Drawing ; German.
3. Advanced Calculus and Spherical Trigonometry ; Topographical Surveying ; German.

THIRD YEAR.

1. Advanced Descriptive Geometry ; Chemistry and Laboratory Practice ; Railroad Surveying.
2. Analytical Mechanics ; Chemistry and Laboratory Practice ; Physics ; Weekly Exercises in Practical Astronomy.
3. Analytical Mechanics ; Astronomy ; Physics ; Weekly Exercises in Practical Astronomy.

FOURTH YEAR.

1. Resistance of Materials and Hydraulics ; Mental Science ; Geology ;
2. Bridges and Construction Drawing ; Constitutional History ; Geodesy.
3. Stone Work ; Physical Laboratory ; Political Economy ; Graduating Thesis.

SCHOOL OF MINING ENGINEERING.

OBJECT AND INSTRUCTION.

This School is intended to qualify the student for undertaking mining operations of all kinds. Its instruction consists of a thorough training in the principles of theoretical and applied chemistry, of chemical and blow-pipe analysis, of assaying and metallurgy, and of the engineering operations of mining.

STUDIES AND APPARATUS.

The course embraces both the engineering and metallurgical studies, with practical exercises in analysis and assaying.

A large collection of models from a celebrated European manufactory, and costing over \$2,000, has been provided for this school. The geological and mineralogical cabinets are well furnished with specimens of minerals, ores and rocks. In the new chemical laboratory, provision is made for metallurgical and assaying laboratories, with stamp mill, furnaces and other apparatus required for practical instruction in this department.

COURSE IN MINING ENGINEERING.

Required for Degree of B. S. in School of Mining Engineering.

FIRST YEAR.

1. Plane Trigonometry and Advanced Geometry; Projection Drawing; French.
2. Analytical Geometry; Descriptive Geometry and Lettering; French.
3. Calculus; Free Hand Drawing; French.

SECOND YEAR.

1. Advanced Algebra and Analytical Geometry; *Chemistry and Laboratory Practice; German.
2. Advanced Calculus; *Chemistry and Laboratory Practice; German.
3. Advanced Calculus and Spherical Trigonometry; Topographical Surveying; German.

THIRD YEAR.

1. Advanced Descriptive Geometry; Surveying; Mineralogy.
2. Analytical Mechanics; Physics; *Chemical Laboratory.
3. Analytical Mechanics; Physics; *Chemical Laboratory.

FOURTH YEAR.

1. Resistance of Materials and Hydraulics; Geology; *Chemical Laboratory, and Metallurgy.
2. Mining Engineering; Constitutional History; *Chemical Laboratory and Metallurgy.
3. *Chemical Laboratory; Drawing; Political Economy; Graduating Thesis.

SCHOOL OF ARCHITECTURE.

OBJECT OF THE SCHOOL.

The School seeks to prepare students for the profession of Architecture. For this a thorough knowledge of scientific principles applied to building, ability and correct taste in design, and

*For explanation of Chemical Laboratory Practice, see courses of Laboratory work in School of Chemistry.

some technical knowledge of the various building trades, with skill in the use of tools, are necessary, and are prominent features of the course of instruction.

INSTRUCTION.

The technical instruction is given chiefly by lectures, illustrated by sketches, models or engravings, and practical application is made by the student.

Drawing is practiced throughout the course, and, as far as possible, original work is executed. Drawing from casts and modeling in clay, give facility in sketching details and correct knowledge of form.

In shop practice, designs are made by the student, to reduced scale, of roofs, stairs, etc., and worked out in wood.

The course in Mathematics, Mechanics, Physics, etc., is nearly identical with that in the other schools of Engineering.

TECHNICAL STUDIES.

Drawing from Casts—Outline sketches and finished drawings in pencil and crayon.

Modeling in Clay—From casts and original designs ; weekly exercises in designing architectural ornaments.

Wood Construction and Drawing—Construction and finish of wooden buildings, roofs, ceilings, domes, towers, stairs, etc.

Iron, Brick and Stone Construction, and Drawing—Buildings of brick, stone and iron walls, arches, stone work, iron fronts, fire-proof floors, etc.

Two lectures and eight hours of drawing weekly.

Architectural Drawing—Preparation of full sets of finished drawings from sketches ; weekly exercises in design of architectural details.

Architectural Designing—Working out of original designs for specified project and preparation of complete finished drawings.

History of Architecture—Daily lectures on history of architectural style ; the construction and decoration employed ; most important examples ; ideas applicable to American architecture.

Æsthetics of Architecture—Three lectures and seven hours' designing weekly in Æsthetics applied to architecture ; laying out

grounds, planning buildings for various purposes, grouping their parts, external and internal decoration, harmonies of color ; general principles of decoration by form and color, for wall paper, hangings, carpets, furniture, etc.

Estimates—Practice in measuring, valuing of materials and labor for all kinds of builders' work and in making out full sets of estimates.

Agreements and Specifications—Lectures on, and preparation of, complete sets.

Heating and Ventilating—The best modes of; fuels, and motion of air in flues.

SPECIAL EXERCISES.

Specimen plates will be required of each student at the close of each term in drawing, to form a part of his record. All such papers must be on paper of regulation size, except when otherwise directed.

SHOP PRACTICE.

To give a practical knowledge of various kinds of work, a full course of instruction is arranged, filling three terms, which all architectural students are required to pursue unless they have already had equivalent practice. The system is similar to the Russian system, so much admired at the Centennial Exposition, but more comprehensive, and applied to building rather than Mechanical Engineering.

First Term—Carpentry and Joinery.

Sharpening Tools, Planing Flat Surfaces, at Right Angles, Uniform Width and Thickness, Framing with Single Tenons, Double Tenons, Splices, Dovetailing, Sticking Moulding.

Second Term—Cabinet Making and Turning, Paneling, Fret Sawing, Veneering, Inlaying in Veneers and Solid Wood, Carving, Finishing and Polishing. Turning Single Forms, Sphere, Vase Plaque, Rosettes.

Third Term—Metal and Stone Work. Pattern Making, Moulding, Casting, Chipping, Filing, Turning, Cutting Screws, Ornamental Work.

Stone Work executed in Plaster of Paris ; Plain Ashler, Moulded Work, Voussoirs of Arches, Domes and Vaults, Carving, incised and in relief.

APPARATUS.

A collection of casts donated by the Spanish Government, and another of casts of various architectural details, from Lehr, of Berlin, belong to the Schools of Architecture and Designing; Models of roofs, trusses, stairs, etc. Models in stone cutting, of Splices, Joints, etc., made by Schroeder, of Darmstadt.

The casts, photographs, etc., of the Art Gallery. A library containing many of the best English, German, French and American Architectural works and Periodicals, such as *Daly's Motifs Historiques*, *Architecture Privee*, *Racinet's Ornament Polychrome*, *Builder*, *Civil Engineer's and Architect's Journal*, *Workshop*, *Skizzenbuch*, *Encyclopedia d'Architecture*, *Owen Jones' Grammar of Ornament*, *Falke's Art in the House*.

A large Carpenter and Cabinet shop, containing full sets of tools, eight sets of shop practice tools, foot lathe with slide rest, chuck, drills, etc. Cross and splitting saws, planer, moulding and tenoning machine, lathe, whittler, fret saw, etc.

BUILDER'S COURSE.

The Trustees allow persons desiring to fit themselves for Master Builders to take a course of a single year, pursuing such technical studies of the course in architecture as they may be prepared to enter upon with profit, and as will be most advantageous to them.

Candidates for the Builder's course must pass the examinations in the common branches, but need not pass in the studies of the Preliminary Year unless they shall desire to pursue other studies than those marked in the following: (The figures denote the hours per week). Fee, \$10 per term.

1. Wood Construction, 10; Projection Drawing, 10; Shop Practice, (Carpentry and Joinery), 10.
2. Stone, Brick and Metal Construction, 10; Architectural Drawing, 10; Shop Practice (Stair Building), 10.
3. Agreements, Specifications, Estimates, Heating and Ventilation, Architectural Designing, 10; Shop Practice (Cabinet Making), 10.

ARCHITECTURAL COURSE.

Required for the Degree of B. S. in School of Architecture.

FIRST YEAR.

1. Projection Drawing, 10; Plane Trigonometry and Advanced Geometry; Shop Practice; French.
2. Descriptive Geometry and Lettering, 10; Analytical Geometry; Shop Practice; French.
3. Modeling, 10; Calculus; Shop Practice; French.

SECOND YEAR.

1. Wood Construction, 10; Advanced Algebra and Analytical Geometry; Free-Hand Drawing, 10.
2. Stone, Brick, and Metal Construction, 10; Advanced Calculus, Architectural Drawing and Designing.
3. Graphical Statics, Architectural Drawing, Astronomy.

THIRD YEAR.

1. Architectural Drawing, 10; Descriptive Geometry and Drawing, 10; Chemistry and Laboratory Practice, 10.
2. History of Architecture, Analytical Mechanics, Physics.
3. History of Architecture, Architectural Designing, 10; Physics.

FOURTH YEAR.

1. Esthetics of Architecture, 10; Resistance of Materials and Hydraulics; History of Civilization.
2. Architectural Designing, 10; Constitutional History; Water Color Sketching, 10, or Geology.
3. Estimates, Agreements and Specifications, Heating and Ventilation, 10; Architectural Designing, 10; Political Economy, Graduating Thesis.



COLLEGE OF NATURAL SCIENCE.

SPECIAL FACULTY,

THE REGENT,

PROFESSOR BURRILL, Dean.	PROFESSOR TAFT,
PROFESSOR WEBER,	PROFESSOR Lou C. ALLEN,
PROFESSOR S. H. PEABODY,	I. O. BAKER,
C. I. HAYS,	GEORGE A. WILD.

SCHOOLS.

SCHOOL OF CHEMISTRY. SCHOOL OF NATURAL HISTORY.
SCHOOL OF DOMESTIC SCIENCE.

ADMISSION.

Candidates for the College of Natural Science must be at least fifteen years of age, and must pass satisfactory examinations in the common school branches and in the studies of the Preliminary Year.

Their preparation should be specially good in the Scientific studies of the Preliminary Year. Some knowledge of drawing of natural objects will also greatly facilitate the student's progress. A knowledge of the Latin language is a good preparation for the mastery of the scientific names which must be learned in this course.

SCHOOL OF CHEMISTRY.

This school aims to impart such knowledge of Chemistry as will enable the student to apply the principles of the science to the related arts, and to fit him for the field of original research, or for the practical business of the Druggist, Pharmacist and Practical Chemist.

INSTRUCTION.

Text-book instruction in the principles of Chemistry and Chemical Physics, occupy six weeks of the first term of the first year. The remainder of the year the recitations alternate with laboratory practice. During the next three years each student is expected to work two hours daily in the laboratory, five days in the week. In order to graduate, each is required at the close of his course, to make an original investigation, and present a Thesis.

Students who pursue Chemistry as a part of other courses work at least two consecutive hours daily during such time as their specialty may require.

Text-Books—Roscoe's Chemistry ; Douglas & Prescott's Analysis ; Fresenius' Analysis ; Miller's Chemistry ; Rose's Analysis.

Books of Reference—Gmelin's Handbook of Chemistry ; Graham-Otto's Ausfuehrliches Lehrbuch der Chemie ; Watts' Dictionary of Chemistry ; Lehmann's Physiological Chemistry ; Percy's Metallurgy ; Mitchell's Practical Assaying ; Wormley's Micro-Chemistry of Poisons ; Taylor on Poison.

Four courses of laboratory work have been arranged as follows :

CHEMICAL COURSE.

FIRST YEAR.

First Term.—Qualitative Analysis, Tests and Separation of the Alkalies, Alkaline Earths, (N H₄) 2 S Group, and 1st and 2d Division of H 2 S Group.

Second Term.—Qualitative Analysis Completed, Tests, and Separation of 3d Division of H₂ S Group, and the Acids, Analysis of 20 Simple Salts, and 20 Compound Substances.

Third Term.—Quantitative Analysis of Sodium Sulphate, Dolomite, Ammonium Alum, Potassium Chloride, Bone Ash, Iron Ore.

SECOND YEAR.

First Term.—Quantitative Analysis of Calamine (Zinc Carbonate), Copper Pyrites, Galena, Spathic Iron Ore, Nickel Ore, Clay, Soil, Determination of Iron, Copper, etc., both volumetrically and gravimetrically.

Second Term.—Volumetric Analysis, Alkalimetry and Acidimetry, Preparation of Standard Solutions, Analysis of Sodium Carbonate, Sodium Hydroxide, Potassium Hydroxide, Pearl Ash, Cream of Tartar, Sulphuric, Hydrochloric, Oxalic and Citric Acids, Analysis of Corn or other Grain.

Third Term.—Preparation of Salts, Acids, etc., Electroplating with Silver, Gold, Copper, Nickel.

THIRD YEAR.

First Term.—Ultimate Analysis, Determination of Carbon, Hydrogen, Oxygen, Nitrogen Chlorine, Phosphorus and Sulphur in Organic Compounds, Analysis of Urine.

Second Term.—Blow Pipe Analysis, Determination of a collection of minerals representing over thirty of the Metals. Assaying in both the dry and wet way of Gold, Silver and Lead Ores.

Third Term.—Photography, Preparation of Ether, Absolute Alcohol, Gun Cotton, Cadmium Iodide, Ammonium Iodide, Glacial Acetic Acid, Silver Nitrate, Collodion, Taking Negatives, Printing Positives, Toning and Mounting.

FOURTH YEAR.

First Term.—Gas Analysis, Calibration of Eudiometers, Analysis of Air from Lungs, Atmospheric Air, Marsh Gas, Illuminating Gas and Crude Coal Gas, Analysis of Mineral Waters.

Second Term.—Toxicology, Micro-Chemistry of Poisons, Testing for Mineral and Vegetable Poisons, Separation from Organic Mixtures.

Third Term —Original Researches, Thesis.

PHARMACEUTICAL COURSE.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Quantitative Analysis of Commercial Drugs, White Lead, Red Lead, Paris Green, Sodium Nitrate, Oxalic Acid, Tartar Emetic, Commercial Hydrochloric, Nitric and Sulphuric Acid.

Second Term.—Analysis of Mineral Waters, Preparation of Tinctures, Solid and Fluid Extracts, Reading and Compounding Prescriptions.

Third Term.—Isolation of Alkaloids, Atropine, Strychnine, Quinine, Nicotine, Aconitine, Morphine, Preparation of Salicylic Acid, Examination of Alcoholic Liquors, Reading and Compounding Prescriptions.

THIRD YEAR.

First Term.—Same as second term, second year of Chemical course.

Second Term.—Same as first term, third year of Chemical course, without Analysis of Urine, Reading and Compounding Prescriptions.

Third Term.—Preparation of Salts, Perfumes, Flavoring Extracts, Cosmetics, Electroplating with Gold, Silver, Copper and Nickel.

FOURTH YEAR.

First Term.—Same as second term, fourth year, of Chemical course.

Second Term.—Analysis of Urine, normal and pathological, Reading and Compounding Prescriptions.

Third Term.—Original Researches, Thesis.

AGRICULTURAL COURSE.

FIRST YEAR.

Same as in Chemical course.

SECOND YEAR.

First Term.—Quantitative Analysis of Feldspar, Soil, Ashes of Plants and Grains.

Second Term.—Analysis of Commercial Fertilizers, Manures and Minerals used for Fertilizers.

Third Term.—Preparation of Organic and Inorganic Salts, Starch from Potatoes, Corn, Wheat, etc., Sugar, Dextrine, Alcohol.

THIRD YEAR.

First Term.—Same as in Chemical course.

Second Term.—Analysis of Milk, Corn, Wheat, Potatoes, Fruits, etc.

Third Term.—Silt Analysis of Soils, Analysis of Mineral Waters.

METALLURGICAL COURSE.

FIRST YEAR.

Same as in Chemical course with the Quantitative Analysis of Brass, Solder and Type Metal in third term.

SECOND YEAR.

First Term.—Same as in Chemical course.

Second Term.—Assaying of Gold, Silver, and Lead Ores, both dry and wet way, Blowpipe Assaying.

Third Term.—Analysis of Malachite, Azurite, Cinnabar, Tin Ore, Cobalt and Nickel Ore containing Arsenic, Bog Manganese, Grey Antimony.

THIRD YEAR.

First Term.—Analysis of Pig Iron, Wrought Iron, Steel, Furnace Slags, Rolling Mill Slags and Cinders.

Second Term.—Same as in Chemical course, with Analysis of Mineral Waters in place of Assaying.

Third Term.—Same as second term, fourth year, of Chemical course, with Analysis of Coal in place of Mineral Waters.

APPARATUS.

The facilities offered for obtaining a practical knowledge of Chemistry are believed to be unsurpassed by those of any other institution in the West. A large Laboratory Building, 75x120 feet, and four stories in height, has just been erected, at an expense, including furniture, of \$40,000.

The Basement is 12 feet high and contains the following rooms :

1st. Furnace room for assaying in the dry way and metallurgical operations. It contains a large smelting furnace, a forge, and an assay furnace. The necessary blast is produced by means of a Sturtevant blower.

2d. Mill room for storing and crushing ores.

3d. A large room for the manufacture of chemicals and pharmaceutical preparations.

4th. Coal cellar.

5th. Boiler room. This room contains one large boiler for heating purposes; an engine with small boiler for running it; a large Sturtevant blower, which delivers 10,000 cubic feet of air per minute, for ventilating and heating; a smaller Sturtevant blower for supplying blast for blowpipes, forges, etc.

6th. Hot air chamber with about three miles of steam pipe. Through this chamber the hot air is forced all over the building by means of the large blower.

The first story is 14 feet high and contains :

1st. A large lecture room capable of seating 200 persons.

2d. Ladies' clothes room.

3d. Gentlemen's clothes room.

4th. Qualitative laboratory, which will accommodate 152 students when fully completed. The number of desks now fitted up are one hundred and four. Each desk has an evaporating hood and a wash bowl with constant supply of water. Near the middle of the room there is a spectroscope table, and a blowpipe table for general use. Large gas hoods and sinks are constructed at the sides of the room for the accommodation of larger apparatus.

5th. Store room. This room has a central location and is completely stocked with apparatus and chemicals for qualitative analysis.

The second story is 14 feet high and is designed for the use of advanced students only. It has the following apartments :

1st. A small lecture room with mineralogical cabinet, and an extensive set of furnace models for illustrating lectures on metallurgy.

2d. Laboratory for students in agricultural chemistry.

3d. Main laboratory for quantitative analysis. These two laboratories will accommodate 152 students when fitted up to their full capacity. Forty-eight desks are now finished, and fur-

nished as those of the lower laboratory with gas hoods and wash bowls.

4th. Store room, completely furnished with apparatus for all kinds of work in quantitative Analysis, both volumetric and gravimetric. The apparatus for general use includes a large platinum retort for the preparation of hydrofluoric acid; a Dove's polarizer, with a complete suit of accompanying apparatus; a Geissler's mercurial air pump; Hoffman's apparatus for illustrating in the lecture-room the composition of compound gases; a Soliel-Scheibler's saccharimeter of the most recent and approved construction; an excellent set of areometers; a Haüy's goniometer; a camera with Ross' lenses; a Ruhmkorff's coil; galvanic batteries of Grove and Bunsen; also a potassium dichromate battery, a galvanometer and a thermo-electric pile, a spectroscope and a large binocular microscope with a full set of accessory apparatus, and a Hartnack microscope; a gas combustion furnace for organic analysis, etc.

5th. Balance room, containing five chemical balances of the manufacture of Bunge, (Short Beam) Becker & Son, and Troemner.

6th. Pharmacy. This room is furnished like a Drug Store with shelves, drawers, prescription desk, balance, graduates, etc. It contains a full set of drugs and pharmaceutical preparations for illustrating lectures on *Materia Medica*. The preparations are made in the laboratory by students in Pharmacy.

7th. Private Laboratory for instructors.

8th. Gas Analysis room. This room has no outside walls excepting to the north, and is entirely cut off from the system of heating and ventilating in order to avoid undue fluctuations of temperature during the analysis of gases. It is furnished with a table especially constructed, and contains a full set of Bunsen's Gasometric Apparatus, a coil, battery, mercury, etc.

On the mansard floor ample provision has been made for the study of Photography. There is a large operating room, with side light and sky light of ground glass, a dark room and a toning room, the latter two of which are well supplied with soft water.

COURSE IN CHEMISTRY.

Required for Degree of B. S. in School of Chemistry.

FIRST YEAR.

1. Chemistry and Laboratory Practice; Trigonometry and Advanced Geometry; British Authors or French.

2. Chemistry and Laboratory Practice; Analytical Geometry; American Authors or French.
3. Organic Chemistry and Laboratory Practice: Calculus or Free hand Drawing; Rhetoric; French (optional).

SECOND YEAR.

1. Laboratory Practice; Physiology or Botany; German.
2. Laboratory Practice; Zoology or Botany; German
3. Laboratory Practice; Zoology; German.

THIRD YEAR.

1. Laboratory Practice; Mineralogy; German.
2. Laboratory Practice; Physics; German.
3. Laboratory Practice; Physics; German.

FOURTH YEAR.

1. Laboratory Work; Mental Science; Meteorology and Physical Geography.
2. Constitutional History; Laboratory Work; Logic.
3. Political Economy; Geology; Laboratory Work and Thesis.

SCHOOL OF NATURAL HISTORY.

The aim of this School is to educate practical geologists, collectors and curators of cabinets and museums of natural history, and superintendents of scientific explorations and surveys. It acquaints the student with the latest researches in respect to the structure of the earth and to the origin and distribution of its organic products; teaches him to collect and preserve specimens and arrange them for study, and to conduct original investigations.

INSTRUCTION.

The instruction is given by lectures and text-books, and excursions, when practicable, made under charge of the professors.

Botany.—Candidates for admission are examined upon Gray's "Lessons in Botany," or an equivalent, and are expected to be able to analyze readily common wild flowers. Beginning with the Fall Term of the second year, systematic and structural Botany is continued by illustrated lectures and laboratory work upon fresh, dried and alcoholic specimens. Students, throughout the course, are required to observe for themselves, and to make notes and drawings of their investigations. A series of these drawings,

upon a uniform scale, together with the accompanying descriptions, are deposited in the library of the Laboratory.

Each student provides himself with suitable pencils, drawing pens and paper, needles in handles, glass slides for mounting objects, and razor for making thin sections. For the first term, a Manual of Botany (Gray's or Wood's) is required. Microscopes and other apparatus are furnished by the University, for which a deposit of three dollars is required, but no charge is made except for damage and material used.

The first six weeks are devoted to the study of the natural orders of flowering plants. About twelve lectures are given upon the characteristics of the prominent orders—their geographical distributions, importance, etc., together with the history of a few special plants and their products. During this time, two hours per day, three days per week, students analyze, in the Laboratory, flowering plants of the more difficult orders, Compositæ, Graminæ, etc., especially such as are best obtained in Autumn. The seventh week is devoted to practical instruction in the use of the compound microscope, and in the preparation of objects. For this, students are furnished with printed directions, and have individual instruction. During the five weeks following, the general morphology of plants, including vegetable anatomy and histology, is studied, there being about ten lectures, and thirty hours of laboratory work. Tests are made from time to time, by the use of disguised vegetable substances. Two Weeks are taken for review, finishing drawings and examination. The special morphology of the great divisions of Cryptogamic and Phænogamic plants, their chief characteristics, their classifications, and the identification of species of Cryptogams, or flowerless plants, constitute the work of the second term. Special attention is given to injurious fungi, from specimens in the herbarium, or grown in the laboratory. Aquaria furnish numerous kind of fresh water algæ, and the green-houses supply specimens in nearly all the groups studied. During the term, there are about twenty lectures, and fifty-four hours of laboratory work, besides review and examination.

The most important books of reference in the English language are Sach's "Text-Book of Botany," LeMaout & Decaisne's "Botany," Gray's "Structural Botany," Lindley's "Introduction to Botany," Berkley's "Cryptogamic Botany and Fungology," Cooke's "Fungi," and "Hand-book of British Fungi."

Vegetable Physiology is studied the third term of the first

year. The physiological part of Sach's Botany, is made the basis of this work, given by lectures with references to other publications, and experimental practice. Respiration, assimilation, the circulation of fluids, the influence of light and temperature, growth and reproduction, are some of the topics treated, and sufficiently show the magnitude and importance of the study. Throughout the course, the attempt is made to introduce the students to the literature of the various subjects, and to acquaint them with the authority for the facts stated.

Anatomy and Physiology.—This study commences the first term of the second year, and the Anatomy is taught by lectures, aided by works of reference. The human skeleton and manikin are made the basis of comparison in the more extended Zoological researches. The Physiology is taught by means of Dalton's Unabridged Work, accompanied by familiar lectures, in which especial attention is given to the subjects of food, digestion, dress, circulation, respiration, ventilation, etc. The senses will be carefully studied, accompanied with suggestions for prolonging their greatest efficiency—the practical and useful always taking the precedence of the merely theoretical, that the controllable powers of the body may be preserved with their most efficient activities, to avoid preventable suffering and death, and secure vigor and happiness.

Zoology continues two terms. In the first, Invertebrate Zoology is studied, unfolding the cardinal facts exemplified in the Sub-Kingdoms, Protozoa, Cœlenterata, Anuloida, Anulosa and Mollusca, together with the general principles of respiration, circulation, special methods of reproduction and development; geographical and geological distribution; principles of natural classification, depending upon morphological type and specialization of the functions, etc.

Vertebrate Zoology follows, embracing embryology, modification of plan by which animals are adapted to the various conditions of existence, as manifest in their Comparative Anatomy; Systematic Zoology, so that the orders may be recognized at sight, etc. Nicholson's Manual of Zoology is used as a text book.

LABORATORY WORK.

Osteology is taken up the winter term, and is designed to give the student a practical and theoretical knowledge of the vertebrate skeleton.

It consists in laboratory work, alternating daily with a study of the comparative Osteological collections in connection with recitations from "Flower's Osteology" as text.

In the laboratory, special attention is given to the cleaning and mounting of both Ligamentary and Articulated skeletons.

Taxidermy is commenced the spring term, and is designed to fit the student for the practical operations of collecting, preserving, and mounting objects of Natural History.

During the early part of the term special attention is given to the collection and "making" of skins of Birds and Mammals, and numerous specimens are so collected and prepared by each student. While the latter part of the term is occupied in mounting specimens from both fresh and dried skins.

Geology.—In Geology, Dana's Manual is used; commencing with Dynamical Geology, which explains the forces known to produce observed phenomena in the crust of the earth; as Life, in the formation of lime-stone, coal, peat; water, in eroding, transporting and depositing material for strata; heat, as manifested in consolidation, metamorphism and crystallization, as well as mountain folds on the surface of a shrinking globe.

Lithological Geology is the next term's work. This treats of the kinds, nature and material of rocks, stratified and unstratified; their mineral constituents; structure original or induced; concretions, veins, dykes, etc.; methods of determining the chronological order of the strata. Also the historic development of the earth as revealed by

Paleontology, or the entombed fossils of the previous inhabitants, through the Silurian and Devonian ages. The third term explains the Carboniferous age with its coal, the Reptilian and Mammalian ages, with their wonderful inhabitants; the Glacial period with its continent of ice, and through to the present time. Here also are discussed the elements of Time, the system of Life, the origin of Species, the climax in Man.

Physical Geography and Meteorology.—The principles of the phenomena manifest in the life of the earth bear the same relation to Geology that Physiology does to Anatomy. This subject, a result of the facts of Geology, with an application of the laws of Physics, is taught by lectures and works of reference. It explains how the solid earth, influenced by winds and waters, driven by heat and electricity, aided by light, constitutes a fit abode for man, the last link of terrestrial being.

Entomology.—The time given to this study is eleven weeks.

After three or four introductory lectures upon the most useful literature, and the methods of collecting and preserving specimens, about five weeks are devoted to the special anatomy of insects and the outlines of classification,—four lectures, and one review or two hours of practical work per week. During this time students make collections as fast as possible, reserving, however, the determination of species until the last half of the term. During this latter portion of the term three lectures per week are given upon injurious and beneficial insects, methods of exterminating, etc., and four hours per week are taken for laboratory work, naming species, noting habits observed, making detailed descriptions, etc. A careful and complete description of some one species, illustrated by drawings of important parts, is made by each student and deposited in the library of the school. The large collection of named species, the ample reference library, the drawings and other illustrations to which students have access, are invaluable aids in the study. The most important reference books are Westwood's "Introduction to the Modern Classification of Insects," Packard's "Guide to the Study of Insects," Harris' "Insects Injurious to Vegetation," and the publications of the Smithsonian Institute, Entomological Societies, and the reports of the State Entomologists.

Students are required to provide themselves with collecting nets and bottles, pins, and lined boxes, and books for notes. Microscopes and other required apparatus are furnished by the University.

Microscopy and Fungology.—Eleven weeks. Students have in this study further practice in the use of the compound microscope, the management of light for particular purposes, the testing of lenses, measurement of magnifying powers and angles of aperture, drawing and photographing objects, preparation and mounting of material etc. The application, as indicated above, is mainly, but not exclusively, devoted to minute fungi, including those of the different fermentations and putrefactions. Such fungi as are known or supposed to be injurious to plants or animals are studied as carefully and thoroughly as circumstances permit, cultures being made for the purpose, and specimens obtained from various sources.

APPARATUS.

In *Botany*, the school has a collection of about one thousand species of the plants indigenous to the State of Illinois, in-

cluding a very nearly complete set of the grasses ; a collection of Rocky Mountain and Western plants ; a collection of plants from Dr. Vasey, Botanist of the Department of Agriculture, Washington, D. C., and others obtained by exchange from various parts of the United States. A collection of the fungi of the vicinity has been begun and already contains numerous species. The green-houses and out-door plantations furnish a large amount of illustrative material for the classes. Enlarged *papier-mache* models of flowers and fruits by Dr. Auzoux, exhibiting structure and development, are in the cabinet. Sections of wood from one hundred and seventy species of trees and shrubs indigenous in Illinois were exhibited at the Centennial and exchanged for foreign specimens. The native specimens now largely duplicated are to be replaced as soon as possible.

In Entomology numerous species have been contributed by the State Entomologist, who is required by law to deposit his first series of specimens in the cabinet of the University. Local collections and exchanges have further increased this number, amounting now to about three thousand species.

The University now has first-class microscopes of four different styles from European makers, one by a prominent American maker, and others of which the glasses were made to order in Europe, and the stands, a new pattern, manufactured in the shops of the University. These latter have a firm iron base with joint for inclining, coarse adjustment by rack and pinion (Jackson Model), fine adjustment attached to stage, glass sliding stage and wide range of power.

In *Zoology* the cabinets contain a human skeleton, (purchased in Paris) and a manikin made by Dr. Auzoux ; skeletons of the different orders of mammals, and of birds ; stuffed preparations of a large number of birds, mammals, fishes, reptiles, etc., (a dissected horse's leg and hoof), a dissected eye, trachea and vocal apparatus, in *papier-mache*, by Dr. Auzoux ; collections of shells, fossils and insects.

The Geological Cabinet has been immensely improved the past year. In addition to the specimens from the State Geological Survey and other illustrative specimens, mineral and fossil, the cabinet has been the recipient of Prof. Ward's celebrated college series of famous fossils, so essential in elucidating the various phases of life in Geological History. This set was the munificent donation of Emory Cobb, Esq., President of the Board of Trustees.

A valuable and extensive collection of the leads of the State, and accompanying mineral, was donated by Gen. J. C. Smith and other gentlemen, of Galena.

COURSE IN SCHOOL OF NATURAL HISTORY.

Required for Degree of B. S. in School of Natural History.

FIRST YEAR.

1. Chemistry ; Free-Hand Drawing, (optional); Trigonometry and Advanced Geometry ; French.
2. Chemistry ; Free-Hand Drawing (optional); Analytical Geometry ; French.
3. Vegetable Physiology ; Chemistry, or Free-Hand Drawing ; Rhetoric ; French, (extra)

SECOND YEAR.

1. Advanced Anatomy and Physiology ; Botany ; German.
2. Zoology ; Botany ; German.
3. Zoology ; Economic Entomology ; German.

THIRD YEAR.

1. Geology ; Mineralogy ; German ; Ancient History (optional, extra.)
2. Geology ; Physics ; German ; Mediæval History (optional, extra.)
3. Geology ; Physics ; Modern History, or Astronomy.

FOURTH YEAR.

1. Meteorology and Physical Geography ; History of Civilization ; Mental Science.
2. Microscopy and Fungology ; Constitutional History ; Logic.
3. Political Economy ; Physical Laboratory ; Natural History ; Laboratory Work ; Graduating Thesis.

SCHOOL OF DOMESTIC SCIENCE.

This is the first School of Domestic Science of high grade, and with a complete course, organized in the United States if not in the world.

OBJECT OF THE SCHOOL.

It is the aim of the School to give to earnest and capable young women an education, not lacking in refinement, but which shall fit them for their great duties and trusts, making them the equals of their educated husbands and associates, and enabling

them to bring the aids of science and culture to the all-important labors and vocations of womanhood.

This School proceeds upon the assumption that the house-keeper needs education as much as the house-builder, the nurse as well as the physician, the leaders of society as surely as the leaders of senates, the mother as much as the father, the woman as well as the man. We discard the old and absurd notion that education is a necessity to man, but only an ornament to woman. If ignorance is a weakness and a disaster in the places of business where the income is won, it is equally so in the places of living, where the income is expended. If science can aid agriculture and the mechanic arts to use more successfully nature's forces and to increase the amount and value of their products, it can equally aid the house-keeper in the finer and more complicated use of those forces and agencies, in the home where winter is to be changed into genial summer by artificial fires, and darkness into day by costly illumination; where the raw products of the field are to be transformed into sweet and wholesome food by a chemistry finer than that of soils, and the products of a hundred manufactories are to be put to their final uses for the health and happiness of life.

The purpose is to provide a full course of instruction in the arts of the household, and the sciences relating thereto. No industry is more important to human happiness and well-being than that which makes the home. And this industry involves principles of science, as many and as profound as those which control any other human employment.

TECHNICAL STUDIES.

Food and Dietetics.—This study extends through two terms. The first term is devoted to the consideration of the simple aliments, such as Sugar, Starch, the Albuminoids, Fats, etc. In the second term, the studies include the compound aliments; Chemical structure of the cereals, especially the Wheat; the chemistry of Bread-Making, care of Milk and Butter; the nature, uses, preservation and preparation of animal and vegetable food, for the healthful, and for the invalids; the chemistry of cooking; chemical composition, preparation and physiological effects of the beverages, such as Tea, Coffee, Chocolate, etc., and the effects of alcoholic drinks.

Domestic Hygiene.—Location of Dwelling Houses, importance of Drainage, uncleanness as a source of disease; necessity

of ventilation and sunlight ; uses, construction, material and hygiene of dress ; principles of nursing and care of the sick.

Household Esthetics.—Principles of taste as applied to ornamentation, furniture, wall and ceiling decoration, carpets, pottery, clothing and landscapes, harmony of colors, forms, proportions, etc.

Household Science.—Principles of heating and ventilation, chemistry of illumination, materials of culinary utensils, tin, iron, brass, etc. ; adulterations of foods.

Domestic Economy.—Economy of time, management of servants, government and instruction of children, household expenditures. *Usages of Society.* Laws of etiquette, social customs, etc.

Home Architecture.—Principal architectural styles, as Grecian, Roman, Gothic, Renaissance, Modern Gothic, etc. ; exterior of the house ; general characteristics ; interiors, chief requisities, convenience, light, warmth, etc. ; requirements of different apartments, programmes for designs, as of cottages of various styles and capacity, farm houses, villas, etc. ; internal decoration and construction ; sanitary requisites, cellars, walls, water supply, etc.

Landscape Drawing and Green-house Work see School of Horticulture.

For other studies see the proper Schools.

HEALTH AND PHYSICAL TRAINING.

A spacious Gymnasium for young women has been fitted up in the library wing, and instruction in calisthenics is given to two or more classes daily. Lectures on health, and its conditions, and on other important topics, will be delivered to these classes, at suitable intervals, and great pains will be taken to secure, to the utmost possible extent, physical vigor, robust health, and a graceful carriage, and to prepare young women to take enlightened care of their own health, and the health of others under their charge.

The materials for the calisthenic uniform must be made up under the direction of the Instructor in this department.

The Trustees desire that all female students shall participate in these exercises unless excused for good cause. They have been witnessed and heartily approved by some of the most eminent medical men in the State, and their value as a means of maintaining good health during a prolonged period of study, and as helping to develop a more perfect physical form and to give ease, strength and grace, is beyond debate.

COURSE IN DOMESTIC SCIENCE.

Required for Degree of B. S. in School of Domestic Science.

FIRST YEAR.

1. Chemistry ; Trigonometry and Drawing ; British Authors.
2. Chemistry ; Designing and Drawing ; American Authors.
3. Chemistry ; Designing and Drawing ; Rhetoric.

SECOND YEAR.

1. Botany ; Physiology ; German or English Classics.
2. Food and Dietetics, (simple aliments) Botany and Green-House ; German or English Classics.
3. Food and Dietetics, (Compound Aliments and principles of Cooking, etc.) Zoology ; German or English Classics.

THIRD YEAR.

1. Domestic Hygiene ; Ancient History ; German or French.
2. Physics ; Mediæval History ; German or French.
3. Physics or Landscape Gardening ; Modern History ; German or French.

FOURTH YEAR.

1. Household Esthetics ; Mental Science ; History of Civilization.
2. Household Science ; Constitutional History ; Logic.
3. Domestic Economy, Usages of Society, etc. ; Political Economy ; Home Architecture ; Graduating Thesis or Oration or Essay.



COLLEGE OF LITERATURE AND SCIENCE.

SPECIAL FACULTY.

THE REGENT,

PROFESSOR SNYDER, Dean.	PROFESSOR PEABODY,
PROFESSOR PICKARD,	PROFESSOR CRAWFORD,
PROFESSOR SHATTUCK,	PROFESSOR BURRILL,
PROFESSOR WEBER,	PROFESSOR TAFT,

CHAS. E. PICKARD.

SCHOOLS.

ENGLISH AND MODERN LANGUAGES.
ANCIENT LANGUAGES AND LITERATURE.

ADMISSION.

Candidates for the School of English and Modern Languages will be examined in Algebra, Geometry, Natural Philosophy, Physiology and Botany or Book-Keeping, and the Latin mentioned below, but not the Greek. Those desiring to enter the School of Ancient Languages will be examined also in the Greek, but not in the elements of Botany, Physiology and Natural Philosophy. The examinations in Latin and Greek will be as follows :

LATIN.

Latin Grammar including Prosody. (Harkness' or Allen and Greenough's). Latin prose composition. (Forty-four exercises, to the passive voice, in Arnold's Latin Prose Composition, or parts one and two, to page 166, of Harkness' Introduction to Elementary Latin Prose Composition, or an equivalent in Allen and Greenough's Latin Composition), four books of Cæsar's Commentaries, six orations of Cicero, and six books of Æneid. *Real equivalents* for any of the above mentioned works will be accept-

ed. The so-called Roman method of pronunciation of Latin is recommended, as found in Allen and Greenough's, or in the last edition of Harkness' Grammar.

GREEK.

Greek Grammar (Goodwin's or Hadley's), Greek Prose Composition (Jones' Exercises in Greek Prose Composition or an equivalent in Arnold's), and four books of Xenophon's Anabasis. Writing Greek with the accents will be required. *The Greek Etymology must be thoroughly learned.*

The so-called Continental sound of the vowels and diphthongs and pronunciation according to the accent are recommended.

OBJECT OF THESE SCHOOLS.

The object of the schools in this College is to furnish a sound and liberal education to fit students for the general duties of life, and especially to prepare them for those business pursuits which require a large measure of literary and scientific knowledge and training. They meet the wants of those who wish to prepare themselves for the labors of the press as editors or publishers, for teachers in the higher institutions, or for the transaction of public business.

Students in the agricultural and other technical schools, desiring to educate themselves as teachers, writers, and professors, in their special departments, require a knowledge of the Ancient, as well as the Modern Languages, to give them a full command of all the instruments and facilities required for the highest proficiency in their studies and proposed work. The University seeks through these Schools to provide for this important part of its mission—the furnishing of teachers to the industrial schools of the country, and investigators and writers for the Arts. The large liberty allowed in the selection of the special studies of his course will permit the student to give such direction to his education as will fit him fully for any chosen sphere or pursuit.

INSTRUCTION.

The plan of instruction embraces, besides the ordinary textbook study, lectures and practical exercises in all the departments, including original researches, essays, criticism, proof reading, and other work intended to illustrate the studies pursued, and exercise the student's own powers. It is designed to give to all the

students voice culture and a training in elocutionary practice.

A prominent aim will be to teach the right use of books, and thus prepare the student for self-directed investigation and study, which will extend beyond the curriculum of his school and the period of his graduation. With this view, constant use of the already ample and continually enlarging stores of the Library will be required and encouraged. As a farther aid in this direction, members of the advanced classes are usually selected to act as assistant librarians. In this service they are able to obtain much valuable knowledge of various departments of Literature and Science, of prominent authors, and the extent and scope of their writings. Of special value as an incentive to, and the means of practice in, English Composition, should be mentioned *THE ILLINI*, a monthly paper edited and published by the students of the several colleges, each of which is appropriately represented in its columns. A printing office has been provided for in the Mechanical Building, and a press with the requisite supply of type.

The Library is well supplied with works illustrating the several periods of English, American, French, and German Literature, as also those of Ancient Literature. It contains at present over eleven thousand well selected volumes, and is constantly growing by purchase at home and abroad. Valuable American and Foreign periodicals are received regularly in the Reading Room, a list of which is given on page 22.

SCHOOL OF ENGLISH AND MODERN LANGUAGES.

ENGLISH LANGUAGE AND LITERATURE.

Studies of the School.—In the arrangement of the studies the endeavor is to present a thorough and extended drill in grammatical and philological study, and in the authors and history of the English Language, affording a training equivalent to the ordinary studies of the classical language. This drill extends through three years of the course, but may be shortened according to the ability and preparation of the student.

The first two terms of the first year are given to a general survey of the whole field of British and American Literature from the middle of the sixteenth century to the present time. All the really representative writers come into notice, and representative specimens from the writings of each are carefully read in class.

Moreover, each student is required each term to read the entire work of some classic author, making choice from a prescribed list. Frequent exercises in writing abstracts or original compositions on themes assigned are also required. The study of Rhetoric occupies the third term.

During the second year some four or five of the great masters are studied, their work analyzed, the shaping forces of their times, and their influences upon succeeding times are investigated. Lectures are given from time to time on Poetry, Epic, Lyric, Dramatic, etc. Writing and reading required as in first year.

In the senior year attention is given to Old English; to the Anglo-Saxon, for which the way has been prepared by the study of both English and German; to Philology; to the Philosophy of English Literature, and to *Æsthetics*. Essays, Forensics, and orations are required.

French and German.—The modern languages taught in this School are confined to one year of French and two years of German. Abundant practical exercises are given both in composition and translation, and the diligent student gains the power to read with ease, scientific and other works in these languages, and may, with a little practice, write and speak them with correctness. A constant attention is also given to the Etymologies common to these languages and the English, and thereby a large advantage is gained by the student in linguistic culture. "He who knows only one language," said Goethe, "knows not even that one properly."

In the first year, the student passes over a complete grammar and reader, acquiring a knowledge of the technicalities of the idiom, and a sufficient vocabulary for the use of books of reference within the course. The second year is devoted to a critical study of the languages and philological analysis, and to a course of select classic reading, composition and conversation.

Mathematics, Physics and Astronomy.—For these studies, see School of Mechanical Engineering.

Natural Sciences.—See Schools of Chemistry and Natural History.

HISTORY AND SOCIAL SCIENCE.

The historical studies are designed to afford a general view of the history, social organization and progress of the race. They embrace also the history of the Arts and Sciences; and of Civilization, the principles of civil polity and law, the philosophy of history, and the principles of political economy and constitution-

al law. The instruction is given chiefly by lectures, with readings of specified authors, and the study of historical geography and chronology.

The course occupies six terms in the third and fourth years of the University Courses.

THIRD YEAR.

Ancient History of Greece and Rome, with notices of other nations; Ancient Geography; Mediæval History; Modern History; general European History; European Geography.

FOURTH YEAR.

Constitutional History of England and the United States, five lectures a week; History of Civilization, Analysis of Historical Forces and Phenomena, notices of the Arts and of the Inductive Sciences; Political Economy.

PHILOSOPHY AND LOGIC.

The studies of this department are taught chiefly by lectures, with readings of specified authors, and written essays. These studies require much maturity of powers, and are therefore confined to the fourth year of the course.

Mental Philosophy. Analysis and classification of mental phenomena; theories of perception, consciousness, imagination, memory, judgment, reason. Mental Physiology, or connection of Body and Mind, healthful conditions of thought, growth and decay of mental and moral powers. Philosophy of Education. Theory of Conscience; Nature of Moral obligation, Moral feeling. The Right. The Good. Practical Ethics; Duties. Formation of character. Ancient Schools of Philosophy; Modern Schools of Philosophy. Influence of philosophy on the progress of civilization, and on modern sciences and arts.

Principles of logic; conditions of valid thinking; forms of arguments; fallacies and their classification. Inductive and scientific reasoning; principles and methods of investigation. Practical applications of logic in the construction of argument, in the detection and answer of fallacies, and in the formation of habits of thinking, and the common judgments of life.

COURSE IN SCHOOL OF ENGLISH AND MODERN LANGUAGES.

Required for Degree of B. L.

FIRST YEAR.

1. Cicero de Amicitia, or British Authors; French; Trigonometry and Advanced Geometry.
2. Livy, or American Authors; French; Analytical Geometry.
3. Rhetoric; French; Calculus, or Drawing; Horace (optional, extra).

SECOND YEAR.

1. English Classics; German; Physiology, or Botany.
2. English Classics; German; Zoology, or Botany.
3. English Classics; German; Astronomy.

THIRD YEAR.

1. German; Chemistry; Ancient History or Geology.
2. German; Physics or Chemistry; Mediæval History.
3. German; Physics; Modern History.

FOURTH YEAR.

1. Anglo-Saxon; Mental Science; History of Civilization.
2. English Literature; Constitutional History; Logic.
3. Æsthetics; Political Economy; Chemistry or Geology; Graduating Thesis or Oration.

SCHOOL OF ANCIENT LANGUAGES AND LITERATURE.

In the School of Ancient Languages and Literature, the methods of instruction, without swerving from their proper aim, to impart a sufficiently full and critical knowledge of the Latin and Greek languages and writings, will make the study of these tongues subservient, in a more than usual degree, to a critical and correct use of the English. With this view, written translations, carefully prepared, with due attention to differences, equivalences and substitution of idioms, and the comparison and discrimination of synonyms, will form part of the entire course.

The study of Latin and Greek Composition will constitute a weekly exercise through the first year, and will be continued, to some extent, through the course. Essays, historical and critical, will be required from time to time, in connection with the works

read, and a free use of the library is urged. It is intended that each student completing the course in Ancient Languages shall have a clear knowledge of the history of Greek and Latin Literature, and of the principal authors in both languages. As an aid to the appreciation of the literature of the two peoples, Greek and Roman history will form an important part of the course, and will be taken up in the beginning of the course, illustrating the works read. In the first term of the third year Ancient History is taken up as a separate study, and especial attention is then given to the history of Greece and Rome, and the nations with whom they came in contact. Classes will be formed for students who wish to carry their classical study farther than the prescribed course, and every assistance will be given them.

For the studies in *History, Philosophy etc.*, see School of English and Modern Languages.

For the studies in *Mathematics and Natural Science*, see Schools of Mechanical Engineering and Natural History.

COURSE IN SCHOOL OF ANCIENT LANGUAGES.

Required for Degree of B. A.

FIRST YEAR.

1. Cicero de Amicitia and prose composition ; Iliad and prose composition ; Trigonometry and Advanced Geometry.
2. Livy and prose composition ; Boise and Freeman's selections from Greek Authors and prose composition ; Analytical Geometry.
3. Odes of Horace and prose composition ; Memorabilia and prose composition ; Calculus.

SECOND YEAR.

1. Satires of Horace ; Thucydides or German ; Physiology.
2. Terence ; Sœphocles or German ; Zoology.
3. Tacitus ; Demosthenes or German ; Astronomy.

THIRD YEAR.

1. Juvenal or French ; Chemistry ; Ancient History or Geology.
2. Quintilian or French ; Physics ; Mediæval History.
3. De Officiis or French ; Physics ; Modern History.

FOURTH YEAR.

1. History of Civilization ; Mental Science ; Meteorology and Physical Geography.
2. Constitutional History ; English Literature ; Logic.
3. Æsthetics ; Plato ; Political Economy ; Graduating Thesis or Oration.

ADDITIONAL SCHOOLS.

NOT INCLUDED IN THE FOUR COLLEGES.

SCHOOL OF MILITARY SCIENCE.

PROFESSOR WM. A. DINWIDDIE,
First Lieut. 2d Cavalry U. S. A.

By the law of Congress, and of the State, the University is required to teach Military Tactics to its students. All able-bodied male students of the College classes are enrolled in the companies of the University Battalion, and receive instruction according to the following programme, the exercises occupying from one to three hours each week (see figures in programme.)

The Military Organization of the University ranks in the State Militia as the University Battalion, Illinois National Guards.

PROGRAMME.

FIRST YEAR. — *Fall Term*—School of Soldier, Manual of Arms, 3. *Winter Term*—School of Company, Firings, etc., 2. *Spring Term*—School of Battalion, 2.

SECOND YEAR. — *Fall Term*—Reviews of Company and Battalion Drill, 2. *Winter Term*—Bugle Calls and Skirmish Drill, 1. *Spring Term*—Skirmish Drill, and Battalion Evolutions, 2.

THIRD YEAR. — *Fall Term*—Reviews, Picket Duty, 1. *Winter Term*—Guard and Picket Duties, 1. *Spring Term*—Skirmish and Battalion Evolution, 1 to 2

FOURTH YEAR — *Fall Term*—Reviews, 1. *Winter Term*—Bayonet Fencing, 1. *Spring Term*—Battalion Evolutions, Target Practice, 1 to 2.

CLASS IN MILITARY SCIENCE.

A class is taught in Military Science and Art, as far as is requisite for officers of the line. From this class are selected the officers of the several companies, for which they act as drill sergeants and instructors. The military instruction is now under the charge of Major W. A. Dinwiddie, an experienced officer of the regular army of the United States. A full supply of arms and ammunition is furnished by the War Department, including 300 cadet rifles and accoutrements, two pieces of field artillery, 1,000 fixed cartridges and 1,000 blank cartridges annually for target practice, with 200 rounds for artillery.

No student is eligible to the military class till he has reached the winter term of the second or Sophomore year, and is in good standing in all his studies. The course of instruction is confined strictly to two years, terminating always with the first term of the fourth or Senior year. No student will be permitted to retain a command who does not maintain a good standing in conduct and scholarship.

The instruction and exercises occupy two hours each week, arranged as far as possible so as not to interfere with any other courses of study, to allow the members of other courses to enter this. Students must be careful, however, to ascertain, before entering the military class, that the proper studies and exercises of their chosen courses will not be interfered with.

Commissions.—The Governor of the State commissions as Captains in the state militia, such students of the Military Class as complete the course thoroughly, and obtain the necessary experience in command, and whom the Faculty of the University recommend for their high character both as students and as gentlemen.

University Uniforms.—Under the authority of the acts of incorporation, the Trustees have prescribed that all male students, after their first term, shall wear the University uniform. The University cap is to be worn from the first. The uniform consists of a suit and cap of cadet gray mixed cloth, of the same color and quality as that worn at West Point, and manufactured by the same establishment. Students can procure them ready-made on their arrival here. The University cap is ornamented in front with the initials I. I. U., surrounded by a wreath. Students will always wear their uniforms on parade, but in their rooms and at recitations may wear other clothing.

The University Library contains books on Military Science, Military History and Engineering.

Gymnasium.—The Drill Hall is furnished with a full set of gymnastic apparatus, and classes in gymnastic exercises are organized in the fall and winter terms under careful leaders. Fee \$1.

Telegraphy.—In connection with the military department there is a Telegraph office in the new University Building with accommodations for learners, and connections with the Mechanical and Military building, the Dormitory and several private houses, making about three miles of telegraph lines. The students form an association or class, and the members join the University main line, using their own instruments in their rooms. The class

appoints its own officers, inspectors, etc., and pays a small contribution for maintaining batteries, etc. At present there are twenty-seven instruments on the line.

COURSE IN SCHOOL OF MILITARY SCIENCE.

SECOND YEAR.

2. School of the Soldier and Company ; Bayonet Fencing, 2
3. School of Battalion ; Ceremonies and Reviews ; Skirmish Drill.

THIRD YEAR.

1. Brigade and Division Evolutions ; Sword Fencing, 2.
2. Guard Outpost and Picket Duty ; Sword Fencing, 2
3. Military Administration ; Reports and Returns ; Theory of Fire-arms ; Target Practice, 2 ; Artillery Drill.

FOURTH YEAR.

1. Organization, etc., of armies ; Art of War ; Field Fortifications, 2.

SCHOOL OF COMMERCE.

IN CHARGE OF F. A. PARSONS, M. L.

The purpose of this school is to make expert professional book-keepers ; correct accountants ; rapid and elegant penmen, and intelligent business men.

The advantages offered here are such as no commercial college can give, since opportunities are presented to those who desire special knowledge in particular kinds of business for additional study in all the departments of Language, Literature, Science and Art.

ADMISSION.

Applicants will be received on passing satisfactory examination in the common school branches.

CURRICULUM.

Two years, at least, are required to accomplish what is proposed in the prospectus and the course of study is arranged for that time, but with special view to accommodate a large number who can spend but one year and wish to acquire sufficient knowledge of book-keeping and business to fit them for the management of general commercial enterprises.

BOOK-KEEPING.

The extensive demand for thorough knowledge of Book-Keeping makes this the most important study of the course. Both systems, Single, and Double Entry, are exhaustively taught through a variety of forms suitable for use in different kinds of business.

The first term of the course is devoted to theoretical work, beginning with the science of accounts, Double Entry, taken up in its simplest elements and extended to more complicated operations, involving the study of forms of books and business paper in daily use; different methods of keeping books; relations of proprietor or-partners to concern and to each other; sources of gains and causes of loss; closing books and business and making statements.

Single Entry is then considered and the process of changing to Double Entry performed and business continued, each student originating, recording and developing his own transactions.

Commission business and Shipping, Mdse. Co. accounts and Consignments close the term's work, each student having opened, kept and closed eleven sets of books. The knowledge thus acquired is then practically applied during the two following terms in

ACTUAL BUSINESS.

On passing satisfactory examination in theoretical work, the student assumes the interesting duties of a business man.

His first act is to draw up a contract with the Bank by the terms of which he is furnished a seat, post-office box, stock of goods, and a cash capital of \$2000.00 in the College Bank currency. To secure the careful use of his money and goods, and to subject him to actual gain or loss, such as every business man must bear, the contract provides for the purchase of his capital at *one-fourth per cent* in real money, and for its sale at the close of business at the same rate. Goods are bought and sold by Mdse. sample tickets at regular daily market rates. The student procures a stock of goods, bank book, check book, note book, draft book, bill heads, etc., and performs transactions and keeps books according to special "Orders of business."

These include eight successive grades of work, with a different system of books for each. At the completion of each "order"

his books and business are closed, paper filed and all examined and graded; when properly finished, business is resumed under a new order.

First Order.—Retail grocery business; simple set of Single Entry books; credit dealings, deposits made, cash handled, bill heads used, checks drawn and statement made.

Second Order.—Partner admitted with cash capital of \$500; student invests with another firm by check for \$500; notes, drafts and orders drawn, due bills issued, partnership settlement and inspection of books made.

Third Order.—Books changed to Double Entry; second partner admitted; additional capital borrowed at bank; interest account, certified checks, accounts current and settlements.

Fourth Order.—Wholesale business; more complicated transactions and greater number of books.

Fifth Order.—Commission business; transactions performed between dealers located in distant cities situated in different parts of the spacious hall, Invoices, Account Sales, Bills of Lading and business correspondence.

Sixth Order.—Agency business and Shipping; commission continued; books kept on an original plan, for which is claimed, *superiority over any other method*, since it affords a sure test of the correct record of each day's transactions.

Seventh Order.—Mdse. Co. accounts, Shipments in company, Joint Adventures, etc.

Eighth Order.—Importing and Jobbing, Bills of Exchange, foreign and domestic, use of Metric system, duties and customs.

PENMANSHIP.

Daily instruction and practice during the first term of 14 weeks is given in both pen and blackboard work, thus fitting the pupil to teach the art. Positions, holding pen, movements, form, principles, analysis and construction of letters are carefully studied and practiced.

Time is held to be quite as important in penmanship as in music and, on this principle, a new method of practice has been adopted with fine results.

COMMERCIAL CALCULATIONS.

The purpose in this study is to economize time; to take short cuts to correct results. Drill work in the simple arithmetical processes constantly used by business men will be frequent and

thorough. Contracted methods are given to enable the student to deal with the common problems in business, rapidly and accurately. Many business men labor through addition with great effort and slowness, often obtaining, at the end, a wrong result.

The method of reading a column of figures for the amount, as a line of letters is taken in for the thought, is taught. It is to the usual method of addition, as short hand reporting is to long hand writing and can be easily acquired.

COMMERCIAL LAW.

Daily recitations upon this subject are held during each Spring term. Among the subjects considered are ; Contracts, Agency, Negotiable Paper, Partnerships, Corporations, Guaranty, Sale of Chattels, Stoppage in Transitu, Payment, Tender, Interest and Usury, Bailments, Insurance, Probate matters and Real Estate Conveyances. Among the authorities referred to, and subject to the student's use in the Library, are ; Blackstone, Kent, Cooley, Story, Parsons, Dillon, Field, Benjamin, Bouvier and Revised Statutes of Illinois.

Lectures are also given on kindred subjects, such as organization and jurisdiction of Federal and State courts, city, county, township and village organizations, proceedings in courts, etc. Practice is required in drawing legal papers, such as contracts, articles of partnership, powers of attorney, bills of sale, deeds, bonds, mortgages, etc.

BANKING.

All of the preceding *may* be taken during the first year, while Banking can be acquired only in the second. The subject is studied theoretically through the first term, the student writing up transactions, taken from the books of a banking house, which cover a period of twelve months. He is then fitted to enter the "Commercial Department Bank," where he fills each different office in succession, performing the duties and keeping the books connected therewith.

All business common in banks is transacted and the books are kept on the modern plan. The experience acquired here fits the student to fill important positions in any bank.

TEACHING.

Students of the second year are given drill work in assisting to instruct a large class in Preparatory Book-keeping. This work

is found exceedingly beneficial, and when it is finished the student is thoroughly posted, for *the test of knowledge is the act of teaching.*

The full course of the School is as follows :

FIRST YEAR.

1. Theoretical Book-keeping in Single and Double Entry, theory of mercantile accounts, the Principal books and auxiliaries, Cash Book, Bill Book, Invoice Book and Sales Book, Notes, Drafts and Checks ; Penmanship and Letter-writing ; British Authors ; Chemistry or French.
2. Actual Business, Retail and Wholesale, books kept by Single Entry, with and without Invoice Book and Sales Book, changed to Double Entry and continued by various methods Bills, Receipts, Notes, Drafts, Checks, and Accounts Current ; Commercial Calculations ; American Authors ; Drawing or French.
3. Actual Business, Agency, Commission and Shipping, Importing and Jobbing, Invoice Book, Domestic and Foreign, Sales Book, Receiving Book, Commission Sales Book, Business Correspondence, Invoices, Account Sales, Bills of Exchange ; Rhetoric ; Drawing or French.

SECOND YEAR.

1. Theoretical Banking and practice in teaching book-keeping ; German, English Classics or Physiology ; History of Civilization or French.
2. Banking by Theory and Practice ; German ; Constitutional History.
3. Actual Banking ; Commercial Law and Forms of Legal Paper ; German ; Political Economy.

SCHOOL OF ART AND DESIGN.

UNDER CHARGE OF PROFESSOR PETER BAUMGRAS.

This School is to subserve a two-fold purpose. 1. It affords to the students of the several colleges the opportunity to acquire such a knowledge of free-hand drawing as their chosen course may require. 2. It offers to such as have a talent or taste for art, the best facilities for pursuing studies in industrial designing or other branches of fine art. Schools of Design, in Europe and in this country, have been found important aids to the higher manufactures, adding to the beauty of fabrics and to the skill and taste of workmen.

The increased interest in the decorative arts and in the man-

ufactures which they require has added new importance to the study of Drawing and Designing. It is the purpose to keep this school of Design abreast with the best movements in this direction.

COURSE OF INSTRUCTION.

The course in Industrial Art and Designing occupies two years, and if faithfully followed, will fit students to become efficient designers in the various branches of industry in which artistic skill and taste are indispensable to success. The course is divided into four stages, as follows :

STAGE A. Elements of Form ; Analysis of Compound Forms ; Outline Drawing on Paper and Black-board ; Principles of Shading ; Elementary Designs ; Lectures on Art ; Descriptive Geometry.

STAGE B. Shading with Pencil, Chalk, Pen, Charcoal, Ink and Sepia ; Monochrome and Distemper Color ; Perspective ; Drawing from Models and Common Objects ; Elementary Designs from Elements of Plant and Animal Forms ; Designs for Specified Objects ; Lectures on Art and its History.

STAGE C. Shading from Models and Casts ; Outlines from Natural Foliage ; Botany as applied to Ornamentation ; Harmony and Contrasts in Color ; Optical and Physical principles underlying Color in Nature ; Contrasts in Design ; Styles and History of Ornamentation ; Higher Linear Perspective and Shadows ; Lectures on Art.

STAGE D. Drawing from Statuary, Casts and Models ; Drawing and Sketching from Nature ; Compositions in Ornamental and Industrial Arts ; Compositions in Monumental and Pictorial Designs ; Analysis of Ornamental Art ; Esthetics ; Water Color and Oil Painting ; Lectures on Art History.

ADVANCED COURSE IN ART AND DESIGN.

This course comprises the regular branches of Figure, Portrait and Landscape Painting ; Designing and Illustrating on Wood ; Modeling in Clay, Wax, etc. It is designed for those who wish to become teachers, or to pursue painting and designing as a profession.

Special art students will be received for this course, and allowed to devote their whole attention to the art studies.

Students completing the full course in Industrial Designing will receive a certificate from the School. Fee for special students, Ten Dollars per term.

MUSICAL DEPARTMENT.

UNDER CHARGE OF MISS CHARLOTTE E. PATCHIN.

COURSE OF INSTRUCTION.

Instruction Book ; Clementi's Sonatines, Op. 36, 37, 38 ; Heller's Studies Op 36, Books 1 and 2 ; Clementi's Sonatin Studien Op. 165 ; Loschhorn's Klavier-Technick ; Czernie's School of Velocity ; Op. 299, Books 1, 2, 3, 4 ; Czernie's Fifty Finishing Studies, Op. 740, Books 1, 2, 3 ; Cramer's Studies, Books 1 and 2 ; Clementi's Gradus ad Parnassum ; Johnson's Thorough Bass and Harmony.

Classical and popular pieces are given during the course. Besides the private lessons, every one is required to attend class meetings, at which the pupils play in presence of each other and the teacher. Blackboard exercises in the varieties of time ; accent, scales, modulation and transposition are given to these classes, qualifying students to render music more intelligently.


The more advanced pupils have an opportunity to take part in public musical rehearsals and in the public exercises of the University societies. A certificate will be given to all who finish the course.

Music may be taken as a University study for two years. Music, although excellent discipline, compared with other studies, is a recreation, and the average student could carry it as a fourth study without inconvenience.

Many people think that it is a great waste of time for any one to study music, unless they exhibit a great talent for it. Every one could not become a Beethoven, nor will the average mathematician make a Kepler, yet, every child is obliged to learn arithmetic, and experience has proved that the mind which can grasp the multiplication table, can master the instruction book ; here, as elsewhere, perseverance and discipline are only other names for talent. Music is becoming so universal, that a knowledge of it is almost a necessity as well as an accomplishment. No other one study can give more personal pleasures, assist so much in society, or contribute so much to the pleasures of home.

TERMS.

Instruction for term of ten weeks—2 lessons a week.....	\$10.00
For term of ten weeks—one lesson per week.....	6.00
Practice on Piano, one hour daily per term.....	2.00

No deduction made on account of absence except in case of protracted illness.  Tuition in advance.

PREPARATORY STUDIES.

PRELIMINARY YEAR.

To meet an urgent demand, the Trustees consented to provide temporarily for teaching the Preparatory Studies, lying between the Common School studies and the proper College studies.

The High Schools of the State are already doing such excellent work, and are multiplying to an extent that it is expected that this Preliminary-year work may soon be dismissed from the University entirely.

Candidates for these classes should not be less than fifteen years old. They must also pass satisfactory examinations in Arithmetic, Geography, English Grammar, and History of the United States. The examination in these branches should be equal to that usually required for a Second Grade certificate for teachers. This examination may be made by county superintendents. The studies taught in the preliminary year are as follows:

PREPARATORY COURSES.

For the Colleges of Engineering, Agriculture and Natural Science.

First Term.—*Algebra*—(Olney's) Fundamental rules, Factoring, Common Divisors and Multiples, Powers and Roots, Calculus of Radicals, Simple Equations, Proportion and Progression. *Physiology*—(Dalton's or an equivalent.) *Book-Keeping*—Single and Double Entry.

Second Term.—*Algebra*—Quadratic equations. *Geometry*—Plane Geometry, Lines, Circumferences, Angles, Polygons as far as equality in Olney's Geometry. *English*—Elements of Composition. (Gilmore's Art of expression or equivalent.) Orthoepy and Word Analysis. (Introduction to Webster's Academic Dictionary). *Natural Philosophy*—(Norton's or an equivalent.)

Third Term.—*Geometry* completed, including solid Geometry and the Sphere. *English* as in second term, with addition of Goldsmith's Traveler or an equivalent, read for analysis. *Botany*—Gray's Lessons in Botany, or an equivalent.

FOR COLLEGE OF LITERATURE AND SCIENCE.

First Term.—*Algebra*, as above. *Latin*, Cæsar. *Greek*, Grammar and Reader.

Second Term.—*Algebra and Geometry*, as above given. *Latin*, Cicero's Orations. *Greek*, Xenophon's Anabasis.

Third Term.—*Geometry* Completed. *Latin*, Virgil's *Æneid*. *Greek*, the *Anabasis*.

N. B. Greek is required only for the School of Ancient Languages. The School of English and Modern Languages, requires Physiology, Natural Philosophy and Botany, or Book-keeping instead of Greek.

Students in the preparatory studies are not matriculated as University students. They pay no entrance fee, but are charged a tuition fee of Ten Dollars a term, and the incidental fee of Five Dollars a term. They have all the privileges of the library and of the public lectures.

No student is matriculated as a College student till all preparatory studies are completed.

MISCELLANY.

EXAMINATIONS.

Written examinations are held at the close of each term or oftener, and whenever any study has been finally completed. Any student failing to answer correctly 75 per cent. of the questions proposed, loses all credit for that study, and is precluded from proceeding with any other studies without special permission.

A record is kept of each student's term work and standing, and from this his final certificate of graduation is made up.

DEGREES AND CERTIFICATES

The law provides "on like recommendation of the Faculty, the Trustees may authorize the Regent, as President of the University, to issue diplomas to such persons as shall have completed satisfactorily the required studies, and sustained the examination therein, conferring such Literary and Scientific Degrees as are usually conferred by Universities for similar or equivalent courses of studies, or such as the Trustees may deem appropriate." Approved May 11, 1877.

In accordance with the law the following system of Degrees has been adopted for the University:

1. All studies will remain as heretofore free. Each student may choose and pursue such studies as he may desire, subject only to such conditions as to preparation, times of study, and

number of studies as may be necessary to secure efficiency in classes and economy in teaching.

2. But students who wish to be candidates for any degree must complete fully the course of studies prescribed for such degree.

3. Students not candidates for any degree will be enrolled as special students, and will receive at the close of their attendance, if not less than a year, the certificates provided by law, with statement of work done and of credits attained.

4. It is designed that the requirements for all the Bachelors' Degrees shall be, as nearly as possible, equal in amount and value.

5. The Degree of Bachelor of Science, B. S., will be given to those who complete either of the courses of studies in the Colleges of Engineering, Agriculture, or Natural Science. The name of the School will be inserted after the degree.

6. The Degree of Bachelor of Letters, B. L., will be given to those who complete the course in the School of English and Modern Languages.

7. The Degree of Bachelor of Arts, B. A., will be given to those who complete the course of the School of Ancient Languages.

8. The Masters' Degrees, M. S., M. L., and M. A., and the equivalent degrees of C. E., M. E., etc., will be only given to those who have pursued and passed examinations on a year of prescribed post-graduate studies, and presented an accepted Thesis, or after a term of successful practice with a Thesis.

DORMITORIES AND BOARD.

There are in the University buildings about one hundred private rooms, which are rented to the students who first apply. Most of the rooms are of ample size for two students. All are without furniture.

There are many boarding houses near the University where either table board or board and rooms can be obtained, with the advantages of the family circle. Boarding clubs are also formed by the students, by which the cost of meals may be reduced to \$2.25 per week. Some students prepare their own meals, and thus reduce expenses still farther.

Coal is purchased at wholesale and furnished to the students at cost.

For estimates of annual expenses, see page 95.

The Young Men's Christian Association of the University

will aid new students in procuring rooms and boarding places.

LABOR.

Labor is furnished as far as possible, to all who desire. It is classified into Educational and Remunerative labor.

Educational Labor is designed as practical instruction, and constitutes a part of the course in several schools. Students are credited with their proficiency in it as in other studies. Nothing is paid for it.

Remunerative Labor is prosecuted for its products, and students are paid for what their work is worth. The maximum rate paid for farm, garden and shop labor is *ten cents*, and for that about the buildings and ornamental grounds, *eight cents per hour*. Students of sufficient experience may be allowed to work by the piece or job, and thus by diligence or skill, secure more pay.

Some students, who have the requisite *skill, industry and economy*, pay their entire expenses by their labor; but, in general, young men cannot count upon doing this at first, without a capital to begin with, either of skill, or of money to serve them till a degree of skill is acquired. As the number of students increases it is found more and more difficult to furnish the labor needed, and students cannot count so certainly upon finding employment.

STUDENTS' GOVERNMENT.

For several years an experiment has been in progress, in self-government of the Students of the University. By permission of the Faculty, the General Assembly of the Students was organized, and a constitution adopted providing for the election of a President, Vice-President, Secretary, and Marshal; for a Senate of twenty-one members, a court consisting of a Chief Justice and two Associate Judges. Under this constitution, laws are enacted by the Senate, which become valid only when approved by the Regent of the University. All offenses against these laws are tried before the Students' Court, and punished by fines according to the class of the offense. Cases which require the severer penalties of suspension or expulsion from the University are referred to the Faculty. Students refusing to pay the fines imposed by the Students' Government are referred to the Faculty and if sentence is approved, are suspended from University privileges. The government has thus far rendered important aid in maintaining good order in the dormitories and grounds, in preserving public prop-

erty, in preventing the visiting of saloons, and in other matters requiring the intervention of authority.

GENERAL DIRECTIONS TO STUDENTS.

Young men or women desiring a liberal education, and living at a distance from any College or University, are often puzzled to understand precisely what they will be required to know and do in order to gain admission. To such these words are addressed :

1. Notice that a College, or a University, (which is properly a collection of Colleges,) is designed for the higher education only, and not for the study of the common branches. None of the common branches, such as Arithmetic, Geography, English Grammar, Reading and Spelling, are taught in this University. These must all be finished before you come.

2. In order to pursue profitably the true College studies, and to keep pace with the classes, you must be ready to pass a strict examination in the common branches just mentioned, and in certain other preparatory studies, differing with the different Colleges of the University. (See pages 26 and 90.)

3. If well prepared only in the common branches above named, you may be admitted, not to the College, but to the Preparatory Classes, in which you will study the other preparatory studies required for admission to College. (See page 90). All preparatory studies must be completed before you can be admitted, as a matriculated student, to any College class.

4. Remember that all College studies are arranged in regular systematic courses, in which each term's work is designed to prepare for the next. To take the studies in their order, you should enter at the beginning of the College year, in September. If unable to enter at that time, you may enter at any later time by making up the studies already passed over by the class.

5. Enter College with the purpose of going through, and make your course regular as far as you go. If obliged to leave before you have finished the course, you will have done the best thing for yourself in the meantime ; while if you remain, the regular course is in nine cases out of ten, the most useful and effective.

Students desiring only a winter's schooling should go to some high school.

EXPENSES.

THE TUITION IS FREE in all the University Classes.

THE MATRICULATION FEE entitles the Student to membership in the University until he completes his studies, and must be paid before he enters. Amount. \$10.00

THE TERM FEE for Incidental Expenses is, for each student 5.00

Room Rent in University Dormitory, each Student per Term. \$2.00 to \$ 8.00

Each Student in the Chemical and Physical Laboratories, and in the Draughting and Engineering Classes, is required to make a deposit varying from 50 cents to \$8, to pay for Chemicals and apparatus used, and for any breakages or damages.

ALL BILLS due the University *must be paid, and the receipt of the Treasurer shown to the Regent before the student can enter the Classes.*

The following are the estimated Maximum and Minimum Annual Expenses, exclusive of books and clothing, of a residence of thirty-six weeks at the University :

	MIN.	MAX.
Term Fees and Room Rent for each Student, - - -	\$21.00	\$ 27 00
Table Board in Boarding Houses and Clubs, - - -	72 00	144.00
Fuel and Light, - - - - -	10.00	15 00
Washing, at 75 cents per dozen. - - - - -	13 50	27.00

Total Annual Amount, - - - - -	\$116.50	\$213 00
Board and Room in Private Houses, per week, - - .	4 00	6.00

FEEs IN THE PRELIMINARY YEAR.

Tuition, per Term, - - - - -	\$10.00
Incidental Fee, per Term, - - - - -	5.00

SPECIAL FEES.

For Music, for 20 lessons, - - - - -	\$10.00
For Painting and Drawing to Special Students, - - - - -	10.00
Graduating Fee, - - - - -	5.00

CAUTION TO PARENTS—STUDENTS' FUNDS.

The Business Agent will receive on deposit any funds parents may intrust to him to meet the expenses of their sons. *No greater error can be committed than to send boys from home with large amounts of spending money, without the authoritative care of some prudent friend. Half the dissipation in Colleges springs from excessive allowances of money. Students have little real need for money beyond that required for fees, board bills and books.*

The attention of parents and guardians is earnestly requested to this matter, and especially in the case of those students who are under 20 years of age.

CALENDAR FOR 1879.

Examinations for Admission, Monday,	- - - -	September 15
First or Fall Term begins, Tuesday,	- - - -	September 16
Closing of the First Term, Tuesday,	- - - -	December 23

Winter Vacation.

FOR 1880.

Examination for Admission to Advanced Classes,	- -	January 5
Opening of the Second or Winter Term, Tuesday,	- -	January 6
Anniversary Day,	- - - -	March 11
Second Term Closes, Tuesday,	- - - -	March 23
Third or Spring Term begins, Tuesday,	- - - -	March 23
Baccalaureate Address in University Chapel,	- - -	June 6
Class Day,	- - - -	June 7
Society Addresses,	- - - -	June 8
Commencement, Wednesday,	- - - -	June 9

Summer Vacation.

Examinations for Admission, Monday,	- - - -	September 13
First or Fall Term begins, Tuesday,	- - - -	September 14
Closing of the First Term,	- - - -	December 21

Winter Vacation.



I. I. U. DIRECTORY.

Spring Term, 1879.

STUDENTS' GOVERNMENT.

EXECUTIVE.

President,	W. N. Butler.
Vice-President,	F. W. Hatch.
Secretary,	E. E. Harden.
Treasurer,	Miss I. Pearman.
Marshal,	J. F. Going.

JUDICIARY.

Chief Justice,	W. J. Bailey.
1st Ass't. Justice,	M. M. Stacy.
2nd Ass't. Justice,	A. N. Talbot.
Pros Attorney,	J. W. Lamson.

LEGISLATIVE.

President,	F. W. Hatch.
Vice-President,	B. A. Slade.
Secretary,	J. A. Allen.
Ass't Secretary,	Miss N. Lawrence.

Members of Senate.

H. M. Beardsley, 1	A. Boothby, 1
F. H. Porter, 1	B. A. Slade, 1
H. Drum, 2	J. G. Cole, 2
J. A. Allen, 2	Minnie Parker, 2
C. S. Barrows, 2	Metta Macknet, 2
Nettie Lawrence, 1	J. W. Haines, 2
T. W. Springer, 1	A. H. Kingman, 3
Miss L. K. Elder, 1	R. D. Jones, 3
Miss J. M. Hammett, 3	J. O. Eley, 3
Miss E. M. Watson, 3	F. M. Pletcher, 3
	A. E. Davis, 3.

ILLINI.

Executive Committee—H. M. Beardsley, J. A. Allen, Miss Macknet, F. W. Hatch, Miss McAllister.

Editor-in-Chief.—H. M. Beardsley.
Office Sup't.—G. W. Palmer,
Business Manager—C. J. Bills.

I. I. U. BATTALION.

Maj. Wm. A. Dinwiddie, U. S. A.,
Professor of Military Science.
Capt. W. A. Thompson, Adjutant.
Co A, Capt. R. P. Coburn,
Co B, Capt. A. Swannell,
Co C, Capt. W. N. Butler,
Co D, Capt. F. E. Walker,
Co E, Capt. S. C. Stanton.

I. I. U. CORNET BAND.

Meets Monday and Thursday nights in Pand Room—14 Instruments.
C. Thomas, Leader.

LITERARY SOCIETIES, ETC.

ALETHENAI.

Young Ladies' Literary Society, Motto: "*Apo tou dunasthai, pros to einai*" Organized, October 4th, 1871; meets every Friday at 7 P. M.
Nettie Kimberlin, President.
Miss A. Lucas, Secretary.

PHILOMATHEAN.

Young Men's Literary Society; Motto: "*Come up Higher.*" Organized March 7th, 1868; meets in Society's Hall, at 7 P. M. every Friday
F. W. Hatch, President.
J. G. Cole, Secretary.

ADELPHIC.

Young Men's Literary Society; Motto: "*Animis opibusque parati*;" organized March 7th, 1868, chartered December 7th, 1872, meets in Society's Hall every Friday, at 7 P. M.
W. A. Thompson, President.
O. F. Howe, Secretary.

SCIENTIFIC ASSOCIATION.

Young Men's Literary Society; Motto: "Through Nature up to Nature's God." Organized February 28th, 1871; meets in Society's Hall every Friday evening at 7 o'clock P. M.
W. P. Johnson, President.
E. Philbrick, Secretary.

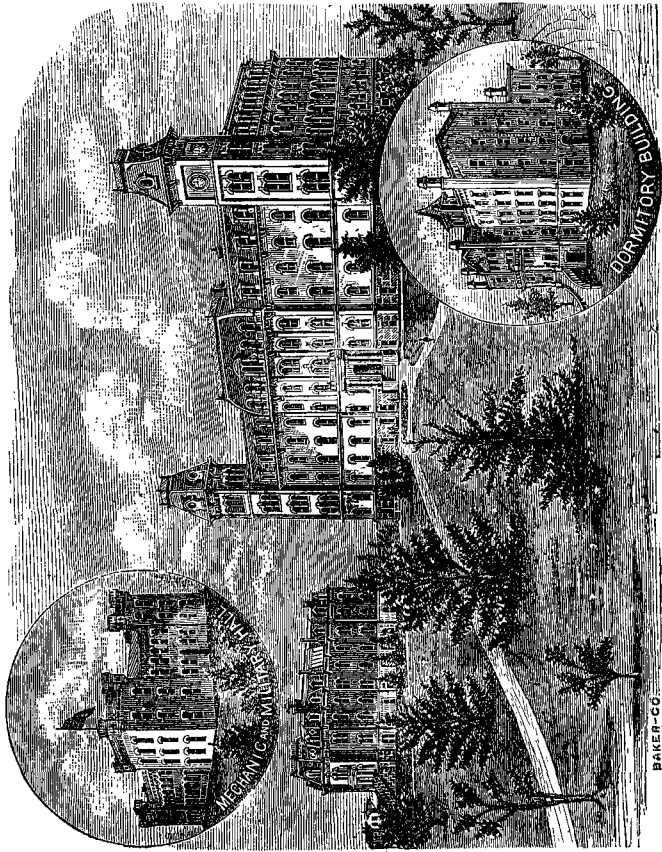
Y. M. C. A.

Room on second floor of Dormitory. Devotional meetings Wednesdays 6.30 P. M., and Sundays 9 A. M. All Students are invited to attend.

I. I. U.,

TELEGRAPHIC ASSOCIATION.

Organized January 9th, 1874, for advancement in Telegraphy. Instruments now on line 25. Central office open for practice all hours of the day.
A. M. Bridge, President.
Mr Constant, Secretary.
E. Lee, Treasurer.
F. Shlandeman, Inspector.



Illinois Industrial University.