COURSE CATALOG

The Thales College undergraduate curriculum equips students to be continuous learners throughout life and teaches them the technical skills and professional knowledge needed to succeed in their future careers.

Students take a sequence of classical core courses and the courses required by their professional major in a prearranged order. Knowing which courses students will take in a given term enables instructors to connect themes between courses, interlinking broader ideas and preparing students for courses to come in subsequent terms. As a result, our students acquire a rich, integrated education.

When combined with mentoring, networking, and daily internships, our students emerge from Thales College with a wealth of knowledge and real world work experience.

THE THALES COLLEGE EXPERIENCE

Thales College is designed as a unique education model. Five facets provide all of the necessary skills and knowledge needed to be an excellent contributor in the workplace and the broader community.

Classical Academics

Rigorous classical studies in the humanities and the student's preferred professional major provide a balanced curriculum of content knowledge. The Classical Core sequence develops the necessary thinking skills and theoretical framework for success in any field. The professional major sequences provide the career-specific content knowledge needed to excel in the field of the student's choice: Entrepreneurial Business, Mechanical Engineering, or Classical Education.

All of our course sequences have been carefully curated to provide a comprehensive, ordered curriculum from Term 1 through graduation. As a result, all courses have been "pre-selected" for students, with a set degree path for each major. This intentional and thoughtful approach ensures that every student receives a high quality education, with no risk of a piecemeal degree that can often be found at other institutions. At the end of their three years, Thales College graduates emerge with a well formed knowledge base and skill set developed from a rigorous and intensive academic formation.

Class Cohort Discussions

Each morning, students convene on campus for lectures and professor-led class discussions, following the Socratic Method of discussion-based learning. These seminars allow students to ask questions, expand their learning, and come to a greater understanding of the topic through interpersonal dialogue.

Students are encouraged to challenge each other, in a lifelong effort of discerning the truth and improving their knowledge and character.

One-on-One Mentoring

Weekly, students meet with a professor one-on-one for mentorship and a unique teaching style modeled after the University of Oxford's "Oxford Tutorial." Professors push students to expand their learning, come to new conclusions, and more deeply understand the content being studied. This teaching style is rigorous but is well-known for fostering student self-confidence and robust critical reasoning abilities.

In addition, professors offer personalized mentoring and advising to assist students in developing a fulfilling career path tailored to their unique interests and abilities.

Internships & Work Experience

Every afternoon, beginning in Term 3, Thales College students have the opportunity to participate in paid internships and work experiences throughout their time at TC. Developing real work experience and career skills is critical to success in the workplace following graduation. In addition, internships provide a low risk opportunity for students to explore a variety of careers before committing to a specific role or industry.

Networking Opportunities

Throughout each academic year, Thales College hosts successful individuals from a variety of backgrounds and industries. These individuals spend time teaching students the wisdom they have learned over the years in their respective fields, and this experience allows students to ask questions and receive guidance as they navigate their own paths in life.

CLASSICAL CORE

All Thales College students complete a challenging core curriculum that spans the best minds of human history. By reviewing all that is known, students build a firm foundation of wisdom from which to base all future thinking. Our curriculum teaches the Western Tradition: its history, its interaction with other civilizations, and the place of the American experiment in that history. In addition to history and literature, students learn the fundamentals of the Trivium–writing, rhetoric, and logic; economics; personal finance; philosophy; physics; and ethics. This broad overview of important concepts ensures that every graduate is fully prepared to function well in the modern world.

REQUIRED COURSES

Credit hours are listed in parentheses.

BUS 100 / HUM 150 The Mindset of Entrepreneurial Masters and Founder's Mentality *(3)*
BUS 110 Stocks, Bonds, Investments, and Personal Finance* *(2)*
ECN 150 Foundational Economic Concepts *(3)*
ECN 300 Philosophy of Economics and Human Action *(3)*
HUM 100 Life and Career Dynamics *(3)*
HUM 110 Introduction to Philosophy: Knowledge & Reality *(3)*
HUM 120 Writing & Rhetoric I *(3)*
HUM 140 Writing & Rhetoric II *(3)*
HUM 160 Western Civilization I *(3)*
HUM 180 Western Civilization II *(4)*
HUM 200 Logic *(3)*
HUM 220 Philosophy of Being Human *(3)*
HUM 240 The Literary Masters I: Ancient and Medieval* *(3)*
HUM 260 The Literary Masters II: Renaissance to Modern* *(3)*
HUM 280 Ethics *(3)*
HUM 300 The Philosophical Masters I: Ancient and Medieval* *(3)*
HUM 320 The Philosophical Masters II: Renaissance to Modern* *(3)*
HUM 400 Politics and Culture of a Free Society *(3)*
HUM 440 American History I* *(3)*
HUM 450 American History II* *(3)*
HUM 480 Virtuous Leadership in a Free Society *(3)*
HUM 490 Capstone* *(2)*
MAT 100 Introduction to Calculus† *(3)*
PHY 100 Introduction to Physics† *(4)*

* *Not required for Mechanical Engineering majors*
† *Mechanical Engineering students take MAT 200: Calculus I (4) and PHY 200: Physics I (4).*

ENTREPRENEURIAL BUSINESS

The Entrepreneurial Business program thoroughly prepares students to lead and contribute in any type of business or management role. Students learn the finer details of effective business, including decision making, the role of economics in real-world dynamics, people management, accounting, business law, and other topics. Experts, known as the "Masters," in the field of business are studied at length, and lessons are sourced from our founder's 45+ years of experience in entrepreneurship.

Beginning in Term 3, students intern at local firms in the greater Raleigh area to apply their knowledge in a real business setting. By sampling a variety of business organizations and roles in a low-risk environment, interns can determine the types of careers they hope to pursue. In addition, the professional connections made during the internship process allow students to secure employment more easily in the future. Thales College Entrepreneurial Business graduates are poised to succeed in any type of business role.

REQUIRED COURSES

Credit hours are listed in parentheses.

BUS 140 Accounting I *(3)*
BUS 160 Accounting II *(3)*
BUS 180 Philosophy of Business and Effective Management *(3)*
BUS 200 Business Development and Selling Your Ideas *(3)*
BUS 220 Financial Modeling in Excel *(3)*
BUS 240 Corporate Finance *(3)*
BUS 260 Capital Allocation: Investments for Business *(3)*
BUS 320 International Finance *(3)*
BUS 340 Product Design *(3)*
BUS 360 Marketing *(3)*
BUS 380 Business Law & Ethics I *(3)*
BUS 440 Business Law & Ethics II *(3)*
BUS 460 Entrepreneurial Ventures *(3)*
BUS 500 Business Strategies *(3)*
MSC 240 Data Analytics for Business *(3)*

CLASSICAL EDUCATION

At Thales College, our Classical Education major thoroughly prepares future classical teachers of all grade levels. The program teaches the history, theory, and practice that are presently being recovered within the classical education renewal movement. The lower school track (Grades K-5) teaches how to approach elementary math, reading, history, and science from a classical perspective. The upper school track (Grades 6-12) prepares future teachers to specialize in the humanities, mathematics, and/or the natural sciences. Both tracks combine academic coursework with professional mentoring to prepare students to be skilled teachers, future leaders in school culture and governance, and lifelong learners who model the classical ideal of a life well-lived.

Thales College's close alliance with Thales Academy, a rapidly growing network of classical K-12 schools throughout the Southeastern US, allows Thales College Classical Education majors to receive extensive observation and student teaching experience within a live classical education setting throughout their time at Thales College. With multiple Thales Academy schools located within 15 minutes of our campus, Thales College students will benefit from real-world classroom experience nearly every term during their time at Thales College.

REQUIRED COURSES

Credit hours are listed in parentheses.

CED 100 Theories of Classical Schooling *(3)*
CED 120 The Moral and Intellectual Development of Young People *(3)*
CED 150 Principles and Methods of Classical Pedagogy *(4)*
CED 180 Principles of Classroom Culture and Direct Instruction *(3)*
CED 200 History of Education *(3)*
CED 240 Teaching the Historical Imagination *(3)*
CED 335 Seeing Beauty in Nature, Science, and Mathematics *(3)*
CED 350 Philosophy of Education *(3)*
CED 370 Writing Across the Disciplines *(3)*

Certificate in Elementary Education

CED 220 Teaching Elementary Reading *(4)*
CED 240 Teaching Elementary Mathematics *(4)*
CED 470 Great Texts for Children *(3)*

Humanities Concentration

CED 160 Reading Fairy Tales and Mythology *(3)*
CED 320 Teaching Economic Reasoning *(3)*
CED 360 Teaching American Civics *(3)*
CED 420 Studies in the Novel *(3)*
CED 470 Great Texts for Children *(3)*
CED 480 Independent Study *(3)*

Mathematics Concentration

CED 115 Euclidean and Non-Euclidean Geometry *(3)*
MAT 210 Calculus II *(4)*
MAT 220 Calculus III *(4)*
MAT 300 Differential Equations *(3)*
CED 425 Discrete Mathematics *(3)*
CED 475 Teaching the Great Experiments & Formulas *(3)*

Science Concentration

BIO 100 Biology *(3)*
CHE 100 Chemistry *(4)*
MAT 210 Calculus II *(4)*
PHY 220 Physics II *(4)*
CED 235 Earth Science: Astronomy, Geology, Meteorology *(3)*
CED 475 Teaching the Great Experiments & Formulas *(3)*

MECHANICAL ENGINEERING

The Thales College Mechanical Engineering program prepares students for a wide range of technical, sales, and industrial careers. Students develop analytical and communication skills while gaining the scientific and technical knowledge needed to be successful engineers. Fundamental principles of mechanical engineering are studied at length, including material properties, technical drawing, thermodynamics, fluid mechanics, electronics, manufacturing, and mechatronics. Classroom studies are enhanced by access to industry equipment at our partner institution, CaptiveAire, a nationwide manufacturer of commercial ventilation systems.

Beginning in Term 3, students apply classroom knowledge daily through our concurrent co-op requirement, working and earning a salary in a local industry firm. Students continue working in a co-op for the remaining two years of their time at Thales College, gaining invaluable experience in an engineering role and preparing to enter the workforce as experienced team members and contributors.

All Mechanical Engineering students benefit from FE exam preparation, and one year of the co-op may be applied to future PE licensure. Thales College's engineering program has been designed to meet the requirements of ABET accreditation. Thales College will apply for ABET accreditation following the graduation of the first engineering class (ABET requires one full graduated class prior to application; if granted, ABET accreditation will be applied retroactively to the first class's degrees).

PROGRAM STANDARDS

Program Objectives:

Alumni of the Thales College Mechanical Engineering program will attain the following objectives within three years of graduating:

1. Be engaged in:
    1. The professional practice of engineering within traditional careers in design, manufacturing, technical sales, and other focuses associated with mechanical engineering.
    2. Graduate school for continued learning and development.
    3. A career oriented toward service, education, or some other form of community betterment.
2. Refine engineering and professional skills developed through the co-op and bootcamp application at Thales College through ongoing professional experience.
3. Provide solutions in the workplace through the application of engineering knowledge and skills.
4. Utilize communication, project management, and leadership skills to function effectively in the workplace and advance team goals.
5. Continuously improve and expand their professional skills through technical experience and a dedication to continuous learning.
6. Demonstrate a commitment to the betterment of society through service, community involvement, and professional work.

Program Admittance and Completion

Declared engineering majors are required to take MAT 200 and PHY 200 during their first and second term (compared to the respective counterparts for the general course of study: MAT 100 and PHY 100). Prospective engineering majors are encouraged to take these advanced sections. Declaration of an engineering major after completion of MAT 100 and PHY 100 may result in

remedial work. Acceptance into the engineering program is contingent upon success in these initial courses. Continuance in the program is contingent upon successful completion of all courses and participation in the engineering bootcamp and internship experiences (see below). The engineering curriculum is uniform for all students and presented in table format below. Upon completed of this course sequence and associated internship programs. the student is awarded a Bachelor of Science in Mechanical Engineering.

Internship Program

Engineering majors at Thales College are offered the unique opportunity of receiving real-world engineering training in a modern industrial environment. A series of multi-week (term-length) programs are designed to cover a series of topics including, but not limited to, various technical skills, engineering design and layouts, process improvement, and safety training. Themes will broadly cover manufacturing, machine control, and thermal-fluid design and analysis.

REQUIRED COURSES

Credit hours are listed in parentheses.

BIO 100 Biology *(3)*
CHE 100 Chemistry *(4)*
MAT 200 Calculus I *(4)*
MAT 210 Calculus II *(4)*
MAT 220 Calculus III *(4)*
MAT 300 Differential Equations *(3)*
PHY 200 Physics I *(4)*
PHY 220 Physics II *(4)*
EGR 110 Advanced Introduction to Programming *(2)*
EGR 120 Technical Drawing *(3)*
EGR 140 Advanced Manufacturing and Supply Chain Logistics *(3)*
EGR 160 Product Design and Development *(3)*
EGR 260 Engineering Codes and Standards *(2)*
EGR 280 Engineering Economics *(3)*
EGR 300 Statics *(3)*
EGR 305 Dynamics, Kinematics, and Vibrations *(4)*
EGR 330 Material Properties and Processing *(3)*
EGR 335 Mechanics of Materials *(3)*
EGR 370 Transport Phenomenon *(3)*
EGR 380 Advanced Thermal-Fluids *(4)*
EGR 390 Thermodynamics *(3)*
EGR 399 FE Exam Review *(1)*
EGR 400 Capstone *(3)*
EGR 405 Mechanical Design and Analysis *(3)*
EGR 410 Electrical and Controls *(3)*
EGR 415 Mechatronics *(3)*

COURSE DESCRIPTIONS

BIO 100 BIOLOGY

This course will introduce topics of the biochemical origins of life, cells and cellular functions, genetics, population and ecosystem dynamics with modelling, and glosses on contemporary topics in the fields of biology, biomedical, and biological engineering.

BUS 100 / HUM 150 THE MINDSET OF ENTREPRENEURIAL MASTERS AND FOUNDER'S MENTALITY

This course offers an in-depth look at the entrepreneurial mindset through stories of well-known companies and the master entrepreneurs behind them. Students learn the characteristics of successful entrepreneurs; current, proven entrepreneurial concepts including kaizen and alertness; how to identify economic opportunity in ordinary settings, including businesses, non-profits, and households; and how entrepreneurs benefit society by producing valuable goods and services, generating unique solutions to problems and providing meaningful work, opportunity for high achievement, and philanthropy.

BUS 110 STOCKS, BONDS, INVESTMENTS, AND PERSONAL FINANCE

This course covers the practical financial knowledge students need. Students will learn essential personal finance concepts and skills, grasp stocks & bonds and their associated benefits and risks, and examine good investment techniques. The course will give students the knowledge and practical foundation to live prudent, shrewd, and financially-sound lives of continual improvement.

BUS 140 ACCOUNTING I

This course introduces the basic principles of accounting. Students will learn a brief history of accounting during the medieval and modern eras and a broad overview of various accounting systems. They will know how to use and analyze accounting data, how to interpret and construct financial accounting statements, and what constitute sound, prudent financial accounting practices.

BUS 160 ACCOUNTING II

This course builds on the basic principles and concepts covered in Accounting I and teaches students the accounting methods used by different kinds of businesses to record, analyze, and classify financial transactions.

BUS 180 PHILOSOPHY OF BUSINESS AND EFFECTIVE MANAGEMENT

The course begins with a philosophy of business based on the fundamental goods of dignified work, production and trade, the essential role of the enterprise to organize these goods, and the vocation to business of those committed to perform this work with integrity. Students learn business theory and practice by acquiring and applying the concepts and wisdom of master business thinkers, including Peter Drucker, Ken Iverson, and Masaaki Imai. Topics include disruptive innovation and management; corporate principles, culture, and governance; managerial information processing and decision making, leadership and ethics; business operations, performance & continuous improvement; goal-setting, incentives, communication and productivity; interpersonal skills, teamwork and group dynamics; conflict and negotiation; and management development.

BUS 200 BUSINESS DEVELOPMENT AND SELLING YOUR IDEAS

This course furthers the students' understanding of entrepreneurialism. It explores the knowledge, skills, and strategies necessary following the initial idea in innovation. This course will teach students how to communicate their ideas, network, present to others, and start to grow a business. Students will effectively learn the sales aspect of entrepreneurship.

BUS 220 FINANCIAL MODELING IN EXCEL

Drawing upon prior liberal arts and entrepreneurial business coursework, students will use financial modeling to address topics in the human dynamics of risk, return, predictive scenarios, decision making, personal finance and life-long investment, business management and economics.

BUS 240 CORPORATE FINANCE

This course teaches the theory, methods, concepts and skills of finance and places them in a human context by relating them to prior and concurrent Thales College philosophy, economics, and entrepreneurship courses. Main concepts include the time value of money, value and capital budgeting, risk and return, market efficiency, real-world applications, capital structure and payout patterns. Faculty mentors help students integrate their use of technical skills with teamwork, non-technical communication, and ethical integrity.

BUS 260 CAPITAL ALLOCATION: INVESTMENTS FOR BUSINESS

This course teaches theory and practice of investment in firms, including the types of investments and markets, analysis and interpretation of financial data, concepts of asset allocation and diversification, portfolio theory and practice, equilibrium in capital markets, fixed income securities, security analysis, and behavioral finance. Faculty mentors help students use their technical skills according to the principle that to be an investor means to invest in people, their productive work, and products and services of true human benefit.

BUS 320 INTERNATIONAL FINANCE

The course begins with a brief historical overview of international finance, including innovations during the Italian Renaissance. Students then learn foreign exchange market theory, current trends and future issues in global financial markets and financial management strategies to address current challenges. They apply concepts such as exchange rate risk to hedging strategies for raising capital abroad, managing the cost of capital for international projects and managing multinational operations. Faculty mentors help students use their technical skills according to the principle that to be an investor, even in an international context means to invest in people, their productive work, and products and services of true human benefit.

BUS 340 PRODUCT DESIGN

This course examines case studies illustrating successful product design and builds the knowledge and skills necessary to participate in the product design process. Students in every professional major take this course to approximate the interdisciplinary product design experience of an actual business setting. Students apply their prior internship experiences and liberal arts instruction in mathematics, logic, and the humanities to learn design processes and evaluate product concepts in a human context.

BUS 360 MARKETING

This course, required of all professional majors, helps students relate marketing concepts to their field of professional study and to collaborate with those in other fields to market products, reflecting an actual business setting. Students draw upon prior profession-specific and liberal arts courses and their internship experiences to explore how the human quest for happiness frames study of consumer behavior, how marketers identify consumer needs, how products satisfy needs, and how to communicate product benefits effectively.

BUS 380 BUSINESS LAW & ETHICS I

This course integrates business law and ethics. Students review moral standards and ethical theories studied in prior humanities courses and apply legal concepts to illustrative cases. Topics include constitutional law, duties, contracts, torts, third party rights, intellectual property, business formation, lending, criminal law, and fraud. Students relate legal concepts to works from the humanities and internship experiences to explore the human context of legal and ethical responsibility, ethical decision making, and the virtue of justice in business relationships.

BUS 440 BUSINESS LAW & ETHICS II

This course applies the ethical and legal principles learned in BUS 375 Business Law I to small to medium sized businesses with a particular focus on entrepreneurship. Students learn the formation, operation and termination of partnerships and corporations, financing, roles of directors, officers, and shareholders, security interests in personal property, bankruptcy, agency relationships, the public regulation of business, international law, and when it is appropriate to consult an attorney. Students relate legal concepts to works from the humanities and internship experiences to explore the human context of legal and ethical responsibility, ethical decision making, and the virtue of justice in business relationships.

BUS 460 ENTREPRENEURIAL VENTURES

In this course, taken in the final term of the program, students from each professional major work together to create new products, approximating actual business activity. The course builds upon skills and knowledge acquired in Product Design, Marketing, other profession-specific courses and internships. Students integrate business theory and practice, engineering, and humanistic thinking to move from market opportunity to product design and to plan for future execution and sale. They identify opportunities, evaluate product design concepts, envision how to structure an organization for growth and plan for staffing and management.

BUS 500 BUSINESS STRATEGIES

This course is the culmination of all of the prior courses in the Entrepreneurial Business degree program. Students will use their knowledge and understanding of business to identify and analyze the effectiveness of the business strategies of successful companies. Using the lessons from these companies, students will develop their own business strategy for a peer to analyze and improve.

CED 100 THEORIES OF CLASSICAL SCHOOLING

This is a course on the idea of classical education and how a school can give practical expression to that idea by advancing the proper goals of teaching and learning. The course begins in recognition that there are important differences between the classical vision of a school (the organization and community) and the contemporary outlook we see today. The course addresses the following questions: What is a school? What is the role of a teacher within a school? How should the faculty function and be organized? What is the role of the student within a school? The parents and the household unit? How should a curriculum be designed and honed? How should the school community and the curriculum utilize weekly, termly, annual, and multi-year rhythms in advancing its goals? What is the correct content, delivery, and goal of the school curriculum? And the co-curriculum? How should the school facility (its buildings and grounds) be linked to its purpose? How should a school be led and governed so that it pursues and maintains its purpose over time? How should these elements of classical schooling respond to contemporary financial, market, cultural, bureaucratic, and government pressures?

CED 115 EUCLIDEAN AND NON-EUCLIDEAN GEOMETRY

This course explores basic Euclidean and non-Euclidian Geometry, with an emphasis on understanding both some of the mathematics and historical developments in Geometry. The beginning of the course will closely follow Euclid's Elements, studying his key axioms and related constructions and theorems, especially on points, lines, magnitude, multitude, circles, quadrilaterals, and triangles. The course will also introduce non-Euclidean geometry, with a brief exploration of Descartes Geometrics and a comparison of the two geometric systems. Emphasis will be placed on proving geometric theorems both orally and in writing.

CED 120 THE MORAL AND INTELLECTUAL DEVELOPMENT OF YOUNG PEOPLE

This course will explore how young people mature into adulthood and how schools can set ambitious and appropriate goals for their development. The course will also explore historical examples of moral and intellectual development of the young adult.

CED 150 PRINCIPLES AND METHODS OF CLASSICAL PEDAGOGY

This course introduces a classical approach to teaching and learning. It begins in recognition that there are important differences between the classical vision of teaching and learning and the contemporary outlook on the classroom. The personhood of student and teacher and the givenness of creation are foundational to classical pedagogy. These deep truths guide us in establishing goals for the classroom, its culture and behaviors, how daily lessons are designed and taught, how to approach homework, which books to read and how to teach them, and how best to assess student learning. The course is designed in two parts: first a consideration of the governing principles of classical pedagogy, and second, a survey of methods of classical pedagogy.

The Lab portion of the course provides students with the opportunity to practice pedagogical techniques in standard areas of classroom instruction, develop a portfolio of resources for their future classroom, and observe and provide feedback to their peers.

CED 160 READING FAIRY TALES AND MYTHOLOGY

This is a course on how to read the foundational stories of the Western tradition with students. The course explores the mythologies of ancient Greece, Rome, the Arthurian tradition, as well as some of the fables, fairy tales, and legends that Western Civilization has preserved for the delight and instruction of our souls. While the course gives attention to the cultivation of a healthy moral imagination through immersion in these stories, questions are also raised about how such stories can actually teach disordered habits of the soul. This course will explore prose and poetry, as well as analysis and criticism of this type of literature. Special emphasis will be given to how to use the seminar, recitations, and essays so that what students read forms their souls for what is true, and good, and beautiful.

CED 180 PRINCIPLES OF CLASSROOM CULTURE AND DIRECT INSTRUCTION

Course description coming soon.

CED 200 HISTORY OF EDUCATION

This course examines some of the major developments that have shaped education in the West from the ancient Greeks, Israelites, and Romans to the present day. In part, this course is organized chronologically, but it is also organized in such a way as to allow for comparison with both the prevailing approach of contemporary education and the classical education movement of the past several decades of which this degree program is a part.

Part I of the course studies the origins and development of Western education from the Greeks, Israelites, and Romans to the medieval Church, tracing out the development of the liberal arts. The course will introduce Socrates, Plato's Academy, Aristotle's Lyceum, the Hebrew wisdom tradition, Roman systems of education, the concept of the teacher and the student within early and medieval Christianity, the 4 cardinal virtues, the 3 Christian virtues, the 7 liberal arts, the concepts of excellence, formation, leisure, catechesis, scholasticism, and developments that came within the Renaissance. Part II studies the continuing developments in Western education from the reformation era to the present time, including major enlightenment figures, the rise of the research university, the division of the disciplines, specialization, the Prussian school system, and the Oxford Movement. The course will also explore major developments within American education including the development of the common school system (public education), the rise of progressive education reform (associated with industrialization and labor unions), and major developments since World War II, placing the classical school movement of recent decades into historical context.

CED 220 TEACHING ELEMENTARY READING

Course description coming soon.

CED 235 EARTH SCIENCE: ASTRONOMY, GEOLOGY, METEOROLOGY

Course description coming soon.

CED 240 TEACHING ELEMENTARY MATHEMATICS

Course description coming soon.

CED 260 TEACHING THE HISTORICAL IMAGINATION

One of the crises of our time is the profound lack of historical imagination that dominates our public discourse. The unwillingness or inability of people to fathom "what it might have been like" in another time and place calls into question the very idea of inter-generational culture. From William Faulkner's oft-quoted insight that "the past is never dead, it isn't even past" to the 10 Commandments, which require the child "to honor your father and mother", the idea has long been a given that we must deal with our past in a sympathetic and decent way, recognizing our own proclivities in the good and evil actions of historical

agents. The course will explore how teachers can effectively use material and textual sources, field trips, family history, episodic history, military history, biography, autobiography, historical fiction, and narrative history.

CED 320 TEACHING ECONOMIC REASONING

In most schools, economics is studied in eleventh or twelfth grade as a field somewhat disconnected from other subjects. While there is value in studying economics separately, teachers of literature, history, and mathematics routinely have the opportunity to help students reason economically within their own subject areas. The purpose of this course is to invite future teachers to recognize the presence of fundamental economic concepts within mathematics and the humanities and to train them how to use the whole of the curriculum to develop economic reasoning skills within their students. The course will explore how to create lessons that teach economic reasoning within a unit on a novel or play, a period of history or an event, or a mathematics concept. When we teach our students to reason economically in addition to our other learning objectives, we help them learn to be at home in the world they inhabit and less prone to misunderstand or never recognize economic principles that are at work in their own lives.

CED 335 SEEING BEAUTY IN NATURE, SCIENCE, AND MATHEMATICS

This is a course on how to offer the classroom as a setting for students to behold subjects truly and therefore to see their beauty. The course will explore intelligible attributes in the observable and audible world, such as order, symmetry, tessellation, infinity, simplicity, harmony, balance, rhythm and human qualities that are proper to seeing and hearing these things, such as attention, focus, memory, wonder, stillness, etc. The goal of this course is to provide future teachers, especially in mathematics and science, with a sense of the beauty of their subjects and the possibilities for enlivening students to be inspired and delighted by these fields.

CED 350 PHILOSOPHY OF EDUCATION

Having studied theories of classical schooling, principles and methods of classical pedagogy, and the history of education in the West to the present day, this course requires students to assess and articulate their views of the fundamental practical and philosophical questions that must always orient the teacher and the school in advancing the proper purposes of education. What is a person? What are persons for? How are persons formed for their proper ends? What does it mean to learn and to know? And how do children come to know and to love the true, the good, and the beautiful? What is the object of knowledge that concerns students and teachers? What are the disciplines, how should they be organized across a curriculum (vertically and horizontally)? Which are the virtues, habits, and skills necessary for human flourishing? What if anything should not be taught or should, perhaps be censored? What is the relationship between the formation of persons and the flourishing of a polity? How should we define academic standards for students and for our schools? This course requires students to become articulate in outlining a comprehensive philosophy of education and linking it to practical features of schooling and classroom instruction.

CED 360 TEACHING AMERICAN CIVICS

This course is designed to train future teachers how to foster in their students the requisite knowledge to be informed and contributing citizens of the United States of America. The course will consider major elements of history, jurisprudence, military, government, economics, and the key institutions that foster social fabric. Teaching American civics requires familiarity with key texts and subjects from a range of disciplines, and therefore this course must be selective and interdisciplinary.

CED 370 WRITING ACROSS THE DISCIPLINES

Teaching students to write is often a task restricted to English courses, but the habit of clear and coherent writing can be developed through any subject. Moreover, it is the process of writing well that routinely facilitates deep engagement with and comprehension of ideas. One of the first and most important skills in writing is description (or narration). Every teacher has the opportunity to require students to be attentive observers and to describe clearly

and succinctly what they are noticing within the field of study. Another critical skill in writing is giving tight, accurate explanations for complex concepts under consideration. In fact, for most people it is only when asked to explain something accurately that they finally work through and grasp hold of the concept. More advanced forms of written thought and expression include argument, critique, and synthesis. On a practical level, this course will explore how teachers in each department across a curriculum can utilize their disciplines as vehicles for teaching students how to write well? During the course students will read, discuss, and emulate some of the most accomplished English writers in order to explore how to describe and explain to, and persuade, inform, and move their readers. On a more theoretical level, the course will also consider the centrality of writing to intellectual development.

CED 420 STUDIES IN THE NOVEL

A standard part of humanities curricula is the exploration of the novel as a literary genre, an artifact of a historical time and place, and as a human drama that teaches us about ourselves and our world. This course studies nine masterpiece novels that are typically read within the 7th-12th grades, with an emphasis on how to read them with students, teach them as exemplars of their genre, as historical artifacts, and as explorations of human nature. The novels each raise deep questions of human struggle and the possibility of hope. They also provide future teachers with the opportunity to consider how to lead students through challenging material, including tragic love, war, desire to be like God, political tyranny, human degradation, and the moral cost of our evil actions. The course will give attention to developing lesson plans, homework assignments, writing and public speaking projects, and course assessments. Special emphasis will be given to how studying these and other novels forms the souls of our students for what is true, and good, and beautiful.

CED 425 DISCRETE MATHEMATICS

This course is an introduction to discrete mathematics with an emphasis on developing basic symbolic logic and proof techniques and the understanding, composition and critiquing of mathematical proofs. In particular the course introduces students to discrete structures, including sets, cardinality, relations, functions, matrices, and graphs. The course also presents discrete mathematics as a mechanism by which we can wrestle with fundamental ontological and epistemological questions about mathematics such as: What are numbers? How does their being relate to the possibility of the divine, and can they be known? What does it mean for a collection to be infinite? Are some infinities larger than others? Does mathematical proof provide real certainty?

CED 470 GREAT TEXTS FOR CHILDREN

This course places an emphasis on learning to love what is good (a moral imagination) through the best fictional and historical children's literature. The course surveys major children and youth writers in literature and outstanding historical writing that engages a child's heart and trains a healthy moral landscape. The course will explore how to teach these and other texts in a way that fosters the habits and virtues of a good and productive life.

CED 475 TEACHING THE GREAT EXPERIMENTS & FORMULAS

This course studies sixteen of the greatest experiments and formulas that have shaped our knowledge of the world. These experiments and formulas have been selected for our course because they are major human achievements and are therefore deserving of our study, because most of them can be fairly well-reproduced within a middle or high school classroom, and because they help us and our students have a sense of the creativity and originality that is possible despite prevailing assumptions and pressures to the contrary. The goal of this course is to equip future mathematics and science teachers with historical, biographical, pedagogical tools that will enrich their teaching and inspire wonder and creativity in their students.

CED 480 INDEPENDENT STUDY

A student in the humanities track may choose to fill a gap in his or her knowledge of the humanities disciplines by undergoing a course of independent study. With the approval of a faculty advisor, the student may choose to study a historical culture or period; an intellectual or artistic movement; or a great artist, thinker, or author not otherwise covered by the courses in the major or the TC core curriculum. A member of the CE faculty will fulfill the role of instructor by scheduling regular Oxford tutorials with the student to discuss the student's ideas and writing.

Emphasis should be placed on independent academic research, the reading of primary texts, and the production of significant written work, such as a term paper or a series of shorter related essays.

CHE 100 CHEMISTRY

This introductory chemistry course focuses on basic chemistry principles and its applications. Topics include atoms and molecules, stoichiometry, basic reactions and kinetics, thermochemistry, with introduction to bond structure and the origin of material properties.

ECN 150 FOUNDATIONAL ECONOMIC CONCEPTS

Thales College considers economics to be fundamental for any educated person. The first of four required economics courses, this course introduces basic economic concepts including value, ownership, use, trade, markets, supply & demand, prices, comparative advantage, division of labor, competition, economies of scale, and profit & loss. It applies those concepts to salient economic issues such as sustainability, unemployment, poverty, economic equality and inequality, taxes, redistribution, monopoly, regulation, fiscal policy, monetary policy, speculation, advertising, globalization, crony capitalism, and free trade vs. protectionism. Students also use economic concepts to learn about the industry in which they would like to work.

ECN 300 PHILOSOPHY OF ECONOMICS AND HUMAN ACTION

This course examines the foundations of free market economics in classical liberal thought. The course begins with a history of economic thought and an examination of concepts such as spontaneous order, self-interest, civil society, the rule of law, property rights, and the mutual benefit of trade. It studies the habits of mind and heart needed to operate and maintain a free economy, such as initiative, creativity, invention, risk-taking, cooperation, organization, and accountability.

EGR 100 INTRODUCTION TO PROGRAMMING

This course is designed to teach basic programming skills and the underlying principles behind them. A progression is made from logical operations and conditional statements to the development of algorithms, flowcharts, and pseudo-code. Syntax is taught from a C-based language. Applications may include basic game design, web or app development, or other at the instructor's discretion.

EGR 110 ADVANCED INTRODUCTION TO PROGRAMMING

This course covers the material of EGR 100 and includes advanced projects designed for engineering majors, including but not limited to finite difference methods and PLC programming.

EGR 120 TECHNICAL DRAWING

This course will lay the foundations for accurate and professional 3D modeling using SolidWorks, including foundational 2D design in Autodesk Fusion 360. Students will understand how to create and manipulate objects in a 3D space, and how to package and present these objects for practical use. Students will study how, why, and at what stages 3D modeling is used in industry for both manufacturing and design. They will use current software and techniques and learn market etiquette.

EGR 140 ADVANCED MANUFACTURING AND SUPPLY CHAIN LOGISTICS

This advanced manufacturing course focuses on the manufacturing process and the role of the supply chain. It provides a foundation of knowledge for applications in the world around us, builds critical thinking, and applies knowledge from prior courses, such as Technical Drawing. The course identifies the interaction between manufacturing and the supply chain and how to maximize efficiency and innovation.

EGR 160 PRODUCT DESIGN AND DEVELOPMENT

This foundational production course focuses on the product design process and its applications. It provides a foundation of knowledge to better understand applications in the world around us, improve critical thinking, and will

be referenced in future courses like Technical Drawing and Advanced Manufacturing & Supply Chain Logistics. Applications include business, economics, manufacturing, and engineering.

EGR 260 ENGINEERING CODES AND STANDARDS

This course is intended to prepare students to enter the workplace with a reliable understanding of its codes and standards.

EGR 280 ENGINEERING ECONOMICS

This course will teach the analysis of the time-value of money and the appropriate capital allocation for personal and corporate investments. Topics include interest rates, rate of return, payback period, stocks, bonds, mutual funds, principal, and gains. Projects will consider executive decision-making for capital investment.

EGR 300 STATICS

This engineering course focuses on the applications of static principles. Topics include equilibrium analysis of forces, moments, load distributions, and virtual work. Pre-requisite for EGR 305.

EGR 305 DYNAMICS, KINEMATICS, AND VIBRATIONS

This advanced engineering course focuses on dynamics and its many applications. Topics include analysis of translational and rotational motion, moments of inertia, and an introduction to harmonics, vibrations, and resonance.

EGR 330 MATERIAL PROPERTIES AND PROCESSING

This introductory materials course focuses on the properties of materials and its applications. Topics include chemical composition of materials, properties of composite materials, and analysis of material treatment to produce such properties. Pre-requisite to EGR 335.

EGR 335 MECHANICS OF MATERIALS

This materials course focuses on behavior of materials and its applications. Topics include stress and strain including compression, shear, and torsional strain. Material strength will be analyzed with a brief introduction to material failure. Applications will focus on manufacturing settings.

EGR 370 TRANSPORT PHENOMENON

An integrated course, the flow of electricity, fluid momentum, heat, and mass are analyzed comprehensively via the governing continuity equations (Ohm's Law, Navier-Stokes reduced to Euler equation, Fourier equation, and Fick's laws). Exploration of the similarities between these flows (such as the hydraulic circuit analogy) and interplay between flows (the Seeback effect or thermophoresis) and analysis. Applications may include electronic circuits, piping networks, heat exchangers, and thermal diagnostic devices.

EGR 380 ADVANCED THERMAL-FLUIDS

This advanced thermal course focuses on the interaction and application of heat transfer, fluid mechanics, and thermodynamics. Topics may include viscous flow, boundary layers, thermal convection, phase change, and radiation. Applications within engineering are explored, culminating in an HVAC/DOAS application project.

EGR 390 THERMODYNAMICS

This course focuses on principles of thermodynamics. This includes the 1st and 2nd Laws of Thermodynamics, forms of energy, properties of substances, entropy, and reversible and irreversible processes. These concepts will be applied to systems such as engines, refrigerators, heat pumps, and power generators. Time permitting, modern topics such as non-equilibrium thermodynamics and constructal theory will be explored.

EGR 399 FE EXAM REVIEW

This course is intended to prepare students to successfully take the FE exam for Mechanical Engineering. It reviews content covered in all courses taken in terms prior.

EGR 400 CAPSTONE

Students are required to complete an engineering capstone project in their 2 terms prior to graduation. The project consists of a student individually working on a real-world project identified, organized, and implemented by the student. The project will be real and achievable, including a design solution with a working prototype. The student will have a Co-op for the full time in Thales College, culminating in an applied Capstone project for the company.

EGR 405 MECHANICAL DESIGN AND ANALYSIS

This course combines knowledge gained in previous courses and applies them to machine design. This includes the use of gears, belts, chains, springs, brakes, and bearings within machines, as well as an understanding of stress, strain, and deflection.

EGR 410 ELECTRICAL AND CONTROLS

This electrical course focuses on circuits, controls, and their applications. Topics may include feedback systems, PID controllers, transform methods and response analysis, with introductions to electrical control components such as op-amps, diodes, and transistors. Applications within mechanical engineering projects and design.

EGR 415 MECHATRONICS

This introductory design mechatronics course integrates and builds on knowledge from the previous electrical and mechanical courses. Topics will further explore control stability and response behavior with an aim towards control system design, machine design and controls, and other topics pertaining to robotics. Applied problems are designed to prepare for advanced automated manufacturing.

HUM 100 LIFE AND CAREER DYNAMICS

Students identify three potential career plans and learn practical skills for testing, evaluating, and revising their plans. They improve their time management and prioritization skills, learn the skills of personal finance and develop the habit of managing their financial resources. They learn how studying the liberal arts deepens personal and professional values and how insights from the humanities impact priorities for life and work.

HUM 110 INTRODUCTION TO PHILOSOPHY: KNOWLEDGE & REALITY

This course introduces students to the academic study of philosophy through asking fundamental questions about knowledge and reality. Epistemology is the study of knowledge and rational belief. Metaphysics is the study of ultimate reality. In the first two-thirds of this course, we will focus on epistemology, and study a few of the main reasons to be confident that we do indeed know most of the everyday things we think we know—and that we can be reliable and intellectually virtuous judges of truth from falsehood. In the final third of the course, we will turn to metaphysics, and explore the degree to which we can use our reason to discover truths about the foundations of existence and God.

HUM 120 WRITING & RHETORIC I

Using examples from exceptional writers in the liberal arts tradition, this course fosters an appreciation of great writing and develops the student's ability in grammar, composition, rhetoric, and critical thinking. The course ends with instruction in advanced composition and rhetorical techniques applied to the classic essay and everyday forms of communication such as e-mails, memos, letters, presentations, and reports.

HUM 140 WRITING & RHETORIC II

This course builds upon the knowledge and skills acquired in HUM 120 Writing & Rhetoric I. The course studies classic examples of great writing and rhetoric and applies them to a variety of formats, including essays, research papers, reports, proposals, presentations, and business communications. Students learn to recognize when research and the documentation of sources are necessary. Course work focuses on the discernment of important matters for consideration, logical thought development, and the truthful, credible, civil and persuasive communication of arguments and outcomes.

HUM 160 WESTERN CIVILIZATION I

Taken in successive terms, the courses Western Civilization I & II help students to understand the arc of human history and Western culture from ancient through medieval to modern eras. Western Civilization I surveys Western culture from ancient Sumer through the Middle Ages, with particular attention to historical context. The course examines some key texts of Western civilization and the cultures that these seminal texts helped to shape. Readings include selections from the Hebrew Scriptures (The Old Testament) and the New Testament, ancient Greek and Roman philosophers, dramatists, and historians, and Christian writers through the Middle Ages. Students explore fundamental questions confronting the human condition, deepen their understanding of the Western tradition, and appreciate the contributions of these writers to the world we live in today.

HUM 180 WESTERN CIVILIZATION II

Western Civilization II examines Western culture from the Renaissance to World War II, with particular attention to historical context. Beginning with the Italian Renaissance, the course traces the impact of major movements including the Protestant Reformation, the Scientific Revolution, and the Enlightenment. The course teaches Western culture via major historical events and the contributions of authors such as John Locke, James Madison, Immanuel Kant, Jean-Jacques Rousseau, Jane Austin, Karl Marx, Charles Darwin, Friedrich Nietzsche, John Henry Newman, Sigmund Freud, Simone Weil, Jean-Paul Sartre and Jacques Maritain.

HUM 200 LOGIC

Students study examples of sound reasoning through logic and argumentation in classic and modern texts. The course demonstrates how inductive and deductive reasoning work together to lead the mind toward sound evidence-based judgment and clear conceptualization. The course introduces the elements of logic, including sentence structure, propositional forms, the syllogism, logical fallacies, and rhetorical tricks that demonstrate the importance of uniting logic and rhetoric. Students practice using logic to analyze problems and arguments, to construct solutions and counter-arguments, and to examine sound (and unsound) reasoning in everyday life.

HUM 220 PHILOSOPHY OF BEING HUMAN

This course introduces philosophy as the search for wisdom and raises fundamental questions about being human: Who are we? What makes us happy? What do we need in order to pursue happiness? What is good for us? What are freedom, knowledge, emotions, habit, identity, and love? What is the meaning of work? What is the meaning of the human body? How should we have good relationships? Students encounter responses from the Ancient Greek philosophers to 21st century thinkers and become well-versed in a variety of attempts to define the human being and their practical implications for how people behave and view themselves.

HUM 240 THE LITERARY MASTERS I: ANCIENT AND MEDIEVAL

The Literary Masters I presents a survey of the great literary works and authors of Western culture, from the ancient Near East through the Middle Ages. We will examine many of the key literary texts of Western civilization, including selections from the Old and New Testaments, the epics of Homer and Virgil, Greek Tragedy, the autobiography of St. Augustine, and Dante's Divine Comedy. The Humanities should help us understand what it means to be human, and this course will explore the fundamental questions confronting the human condition.

HUM 260 THE LITERARY MASTERS II: RENAISSANCE TO MODERN

The Literary Masters II presents a survey of the great literary works and authors of Western culture, from the Renaissance to the modern world, including Shakespeare's plays, Paradise Lost, Don Quixote, Romantic poetry, the great 19th century European novels of the likes of Austen, Dickens, and Tolstoy, and the modernist prose and poetry of Woolf and Eliot. By taking this course, students will deepen both their understanding of the Western tradition and their appreciation for some of the greatest works of artistic beauty and genius in human history. They also will assess if and how these literary works prescribe a way of life most conducive for all of human flourishing.

HUM 280 ETHICS

This course raises the question "As human beings, how ought we to live?" and introduces the main ethical approaches of moral philosophers over the past 2500 years: Utilitarianism, Duty Ethics, Natural Law-Virtue Ethics, and Divine Command Theory. In-depth discussion of selected ethical issues and cases helps students distinguish diverse moral views in contemporary culture, evaluate their strengths and vulnerabilities, and discern a path of ethical integrity in life and work.

HUM 300 THE PHILOSOPHICAL MASTERS I: ANCIENT AND MEDIEVAL

The Philosophical Masters I presents a survey of Western philosophy from ancient Greece through the High Middle Ages. We will examine many of the key texts of Western civilization, including the dialogues of Plato, Aristotle's treatises on ethics and metaphysics, works from the Skeptic and Stoic schools, the early Christian Neo-Platonism of Augustine and Boethius, and the scholastic thought of Aquinas and Duns Scotus. At Thales College, we learn the arts of thinking through studying the best of thought: the most powerful and profound thinkers, ideas, and arguments in human history.

HUM 320 THE PHILOSOPHICAL MASTERS II: RENAISSANCE TO MODERN

The Philosophical Masters II presents a survey of Western philosophy from the Renaissance to the present. We will examine many of the great thinkers and texts that have shaped the modern world, from the giants of the early modern period such as Descartes, Leibniz, Locke, and Hume, to the epoch-defining metaphysical and ethical systems of Immanuel Kant, through Mill and Nietzsche in the 19th century, and culminating in the foundations of contemporary analytic philosophy with the works of Frege, Russell, Wittgenstein, Quine, and Kripke. Students will read and discuss the ideas found in these great texts and develop a humble, intellectually open, yet confident disposition for interacting with those who share their own perspective as well as those who may challenge it. When we disagree with a text or with a colleague, we will learn to defend our views with reason, cogency, and charity.

HUM 400 POLITICS AND CULTURE OF A FREE SOCIETY

This course defines a free society composed of three sets of institutions--the family, civil society, and government--that participate in three social systems--economic, political, and cultural--designed to promote free association and the free exchange of property and ideas. The course builds upon prior economics, humanities, and applied mathematics courses and internship experiences to explore how a free people might form culture and conduct politics for a flourishing society. Students apply principles of political participation, such as the common good, rights and political virtues, to current issues in contemporary society, such as globalization, citizenship, the exercise of and limits to freedoms of religion, conscience, and speech, and privacy, with special attention to digital communication and social media.

HUM 440 AMERICAN HISTORY I

This course will examine the underlying political philosophy and foundational principles of the Founding Fathers, whose minds were shaped by a Christian culture and by authors of the Greco-Roman and Early Modern worlds. This course will examine how these traditions shaped the American Revolution, the U.S. Constitution, the early years of the American Republic, and challenges to America's Constitutional Framework through the American Civil War.

HUM 450 AMERICAN HISTORY II

This course continues to examine the American experiment after the Civil War through industrialization, the Progressive Era, World Wars, the Cold War and its aftermath until the current period. The course covers the events, major figures, and ideas that shaped each period.

HUM 480 VIRTUOUS LEADERSHIP IN A FREE SOCIETY

This course reviews briefly the composition of a free society in the family, civil society, and government and social principles such as subsidiarity, solidarity, and the common good. The course focuses on the essential habits of mind and heart needed to maintain free institutions, such as trust, respect for truth, honest, candid and respectful public discourse, integrity in business and in civil service, a sense of public spirit and volunteerism, and political

virtues such as political prudence, loyal opposition, and toleration. Students draw upon prior humanities courses and internship experience to apply these habits to the leadership of Civil Society's institutions at various levels, such as businesses and non-profit service organizations, cultural institutions such as schools and the press, political institutions such as political parties and public policy research institutes.

HUM 490 CAPSTONE

The Capstone course enables each student to integrate their liberal arts, professional studies, and internship experience into a project that highlights their talents and strengths and prepares them to meet post-graduation goals. Students work one-on-one with a faculty member and are encouraged to involve members of their professional and social networks to guide their work. Capstone projects can take various forms, including a thesis, portfolio, product development plan, audio or video production, or a website. The student will submit the capstone project in a tangible form that can be evaluated and present the work to a public audience. Required of all majors except Mechanical Engineering.

MAT 090 PRE-CALCULUS

This course is taken as remedial preparation for MAT 100. Topics covered include an extensive survey of functions and graphing techniques, including in-depth analysis of polynomial, rational, exponential, logarithmic, and trigonometric functions and their properties. The course will also cover analytic trigonometry, conic sections and geometry of the coordinate plane, vector analysis, and an introduction to limits, as well as a variety of discrete math topics, such as sequences, series, and probability.

MAT 100 INTRODUCTION TO CALCULUS

This introductory calculus course focuses on single variable calculus and its applications. Topics include integration, differentiation, the fundamental theorem, with introductions to techniques of integration and differentiation, infinite series, and limits in a historically informed sequence. Applications will focus on science, engineering, and business with a focus on modeling and optimization. As part of the liberal arts core, this course is supplemented by explorations on the topic of infinity and its importance to calculus and beyond. Pre-requisite for PHY 100. For mechanical engineering majors, this course is replaced with MAT 200: Calculus I.

MAT 200 CALCULUS I

This course covers all material listed in MAT 100 with an advanced exploration of techniques such as integration by parts, power series expansions of transcendental functions with associated proofs. Advanced applied exercises are included in preparation for PHY 200.

MAT 210 CALCULUS II

An intermediate calculus course to build upon foundations from Calculus I. Topics will sequences, series, power series expansions, applications of power series including finite difference methods. An introduction of complex analysis includes complex power series and their convergence, complex transcendental and trigonometric functions and their importance to modeling in physics and engineering.

MAT 220 CALCULUS III

This covers vector calculus and its operations. Linear algebra is introduced to explain vector spaces before exploration of vector operations such as dot and cross products, gradients, divergence and curl. Line integrals, Green's theorem and Stokes' theorem will also be covered in tandem with their applications to electricity and magnetism as well as fluid mechanics.

MAT 300 DIFFERENTIAL EQUATIONS

This covers ordinary differential equations of the first and second order and their solutions with an introduction to special partial differential equations such as the heat and wave equations. Solution methods include substitution, transforms, and separation of variables. Applications will focus on the modeling of these equations for physical systems with numerical and computational solutions included.

MSC 240 DATA ANALYTICS FOR BUSINESS

This course teaches basic concepts and methods in how data is collected, organized, analyzed, visualized and used ethically to understand and predict trends in society and in business, make decisions, and act constructively. Students draw from prior liberal arts and professional courses to study real world examples demonstrating how data analysis has actually been used to significantly improve society, a business, or an industry. Students plan and implement an analytics project from the beginning stages of design, through planning, development of specifications, the use of flow charts, and presentation techniques. The course develops skills in Excel, C, and at least one other software, e.g., Tableau, that are required to obtain professional certifications in these technologies.

PHY 100 INTRODUCTION TO PHYSICS

This introductory physics course focuses on classical mechanics and its applications. It provides a foundation of knowledge to better understand applications in the world around us, improve critical thinking, and is something to build on for future studies. This includes vectors, kinematics, forces, motion, momentum, and energy. Time permitting, brief introductions will be made for topics of modern physics. These concepts will be applied to practical scenarios to build understanding of the course application in the world. As part of the liberal arts core, this course is supplemented by an exploration of philosophical ideas of matter, motion, and the causes and ends of motions through primary texts of eminent physicists. For mechanical engineering majors, this course is replaced with PHY 200: Physics I.

PHY 220 PHYSICS II

This introductory calculus course focuses on electricity and magnetism and its applications. Topics include electrostatics, magnetostatics, electrodynamics, radiation, with introduction to applied topics such as optics and circuits. (Pre-requisites: PHY 200, MAT 220).