Grade 12 | 2022 - 2023
Academic Course Guide

Introduction

What makes Avenues unique is how we teach. In this course guide you will find distinguishing differences of an Avenues education—the learning experiences that define a student's journey through Avenues Secondary Division. Our program gives students the skills they need to thrive in a world where emphasis is placed on what you can do with what you know. We believe it is the strongest possible response to a future that we cannot yet imagine, but for which we can prepare.

Students attending Avenues will gain access to a highly enriching and stimulating curriculum and co-curricular experience. In each grade, students are exposed to interdisciplinary experiences and studies. Here we combine the knowledge and curricular approach of two or more academic disciplines into one activity to examine a central experience, phenomena or real-world issue. By encouraging students to think across, rather than within, traditional fields of study, this approach invites them to practice the expansive thinking necessary to formulate innovative solutions to the world's most pressing problems. Whenever possible, the intersections between subjects such as English, art and design, World Course and science are emphasized. Furthermore, intensive study in mathematics, Portuguese, Wellness and Movement along with High Intensity Practice in math and writing (HIP) round out the instructional core.

Because decision-making is an important part of our total learning process, during their secondary years, students are also afforded the opportunity to take elective courses. Teachers, deans, and parents or guardians can support students as they select the electives that best fit their talents, needs, interests and future goals.

The following course descriptions highlight the wide variety of learning opportunities in which Avenues students will engage. If you have any questions, please feel free to contact me or reach out directly to your child's dean. We would be pleased to discuss with families a student's specific learning need.

Sincerely,

John Ciallelo
Head of Secondary Division
Avenues São Paulo

Action Steps

1. **Review this Grade 12 Course Guide** for information on course offerings in both Semester 1 and Semester 2.
2. **Contact your dean** with any questions on how next year's academic program connects to interests and post-secondary plans.
3. Students interested in enrolling in Mastery Workshop **must complete the mandatory Mastery Program Application before the Monday, June 6th deadline**
4. **Select your preferred courses** on Monday, June 6th. The course selection process will occur on campus and students will receive more details in the upcoming days.

Semester 1 Academic Program

Each 12th grade student will enroll in 4.0 academic credits in Semester 1 including the following three courses of study:

Course 1: Programa Brasileiro

- *Semester-long course*
- *1 period / day*
- *1.0 credit earned at the end of Semester 1*

This culminating Grade 12 course integrates Portuguese language and literature within the context of World Course themes. As the world and our country present increasingly complex challenges, Programa Brasileiro aims to explore them from this combined perspective, fostering abilities that will prepare every senior not only to investigate our society but to take action when in it. Prepare to explore the artistic, cultural, social, political, and economic elements embedded in the fabric of our society by seeking to understand their origins, their issues, and by pondering possible solutions. While all G12 students will enroll in Semester 1 Portuguese / Brazilian Program, students may also opt into other Semester 2 electives centered on Portuguese language and/or Humanities topics.

Course 2: Grade 12 Core Math

- *Semester-long course*
- *1 period / day*
- *1.0 credit earned at the end of Semester 1*

Grade 12 students enroll in specialized, senior-only math electives aligned to student interest and post-secondary aspirations. While all G12 students will enroll in Semester 1 Math, some may also opt into another Math elective in Semester 2.

Course 3: Senior Seminar

- *Semester-long course*
- *2 periods / day*
- *2.0 credits earned at the end of Semester 1*

Senior Seminar represents robust collaborative connections between disciplines and, as such, marks the pinnacle of the Avenues experience. These interdisciplinary, seniors-only courses challenge students to demonstrate a depth of understanding appropriate for the end of their journey through the upper grades, while preparing students for post-secondary success by integrating a Deans and college-readiness program with English skills and practices in a thematic course catered to student interest. These courses will run for half the day each day in the first semester of grade 12, and will count as 1.0 English credit as well as 1.0 elective credit in either the humanities or sciences.

Students will join one of four Senior Seminar options:

- *The Artist's Studio*
- *Communications*
- *Entrepreneurship and Social Innovation*
- *Science and Engineering*

Semester 1 Overview

Periods 1 and 2		**Periods 3 and 4**
Programa Brasileiro	Grade 12 Core Math	Senior Seminar

Semester 1 Elective Options

Select <u>one</u> Semester 1 Senior Seminar and <u>one</u> Semester 1 Grade 12 Core Math

- Senior Seminar
    - The Artist's Studio
    - Communications
    - Entrepreneurship and Social Innovation
    - Science and Engineering

- Mathematics
    - Functions, Probability and Data Analysis
    - Introduction to Calculus
    - Calculus

Semester 1 Senior Seminar Themes

The Artist's Studio

The painter, the sculptor, the photographer, the performer, the composer, and other artists, regardless of your medium, will find a home in this senior seminar designed around furthering your skills and techniques, providing and receiving regular critiques, and expanding your individual portfolio.

Communications

Students who intend to pursue a career pathway in the communication fields will contribute to the ongoing development of the Agora Project - a cross-campus collaborative space for digital media that ranges from written pieces to podcast, video, and other modes of communication. Develop your technical skills across a range of media and learn the techniques that professionals use to tell stories in long-form, short-form, text, and image.

Entrepreneurship and Social Innovation

Build your own business and save the world. In this seminar, students will further their study of economics, design thinking, and social innovation to develop practical businesses that result in change for social good. Students interested in business and entrepreneurship will gain valuable skills and tools for their future study and leave ready to implement an actual business plan if they choose to pursue their work. Feedback from real partners and local business leaders will help to sharpen your presentation skills and deepen your understanding of what it takes to be an agent of change in the modern business world.

Science and Engineering

This senior seminar is designed for students interested in pursuing STEM fields beyond graduation. The focus will be authentic science research and design, studying real-world problems and developing, prototyping, and proposing meaningful solutions. Students who prefer to focus on the natural sciences may explore solutions to global climate issues in context, while students who are more interested in invention and making may pursue an independent or small group patent proposal for innovations of their own design.

Semester 2 Academic Programs

All Grade 12 students will enroll in 4.0 credits academic courses in Semester 2 following one of three academic pathways:

Pathway 1: Four (4) Academic Electives

Reference Academic Elective course descriptions on the following pages.

Course 1	Course 2	Course 3	Course 4
Academic Elective #1	Academic Elective #2	Academic Elective #3	Academic Elective #4

Note: Most students will enroll in academic electives that take place in person on our campus with a teacher and São Paulo classmates. Beginning this year, students have the option to enroll in online Global Electives. Details on Global Electives are included at the end of this course guide.

Pathway 2: Double Block of Mastery Seminar 12 + Two (2) Academic Electives

- *Mastery Seminar 12 is designed for students who have already demonstrated evidence of self-determined project work and a particular, well-planned personal project in mind.*
- *Unlike the foundational courses - Intro to Mastery and Mastery Workshop - Mastery Seminar 12 is **not** a course designed for students to explore various potential projects. Rather, it is a space for students to execute projects they have already begun or projects with a defined action plan.*
- *Entrance to Mastery Seminar 12 requires an approved application plus an interview with the Mastery Team. The application for Mastery Seminar 12 will be shared in Semester 1 of your Grade 12 year*
- *Students accepted to Mastery Seminar 12 will have two class periods each today - Periods 3 and 4 - to develop, refine, and showcase their project.*
    - *Important: An accepted Mastery Seminar 12 application is not guaranteed. Thus, all Grade 12 students will select 4 Academic Electives in the Course Preference Form. In the circumstance a student is accepted into Mastery Seminar 12, that course will take the place of the two Academic Electives that take place in Periods 3 and 4.*

Pathway 3: Double Block of Apprenticeship 12 + Two (2) Academic Electives

- *Grade 12 students also have the option to apply for a part-time Apprenticeship in Semester 2.*
- *Apprenticeships offer students the opportunity to extend their learning through hands-on work with an off-campus partner company or organization.*
- *Similar to the plan for Mastery Seminar 12 described above, students accepted to a Semester 2 Apprenticeship will also enroll in 2 academic electives in addition to Apprenticeship 12 that will take place in Periods 3 and 4.*
- *More information on Apprenticeships will be shared next semester. All Grade 12 students, regardless of Apprenticeship interest, must fully complete the Grade 12 Course Preference Form for both semesters.*

Course 1	Course 2	Course 3 (Double Block)
Academic Elective #1	Academic Elective #2	Mastery Seminar 12 -or- Apprenticeship 12

* *Please note that coursework in all three Semester 2 Academic Programs is credit-bearing.*

** *All courses receive a letter grade with the exception of Mastery Seminar 12 and Apprenticeship 12, which are Pass / Fail.*

*** *All Grade 12 students are required to indicate their current preferences for Semester 2 electives now so we can best anticipate student elective needs. There will be an add/drop process at the end of Semester 1 to account for shifts in student interest throughout the semester.*

2022 - 2023 Semester 2 Academic Electives

Avenues São Paulo Academic Electives (Live, In Person)

- Visual Arts and Design
    - Studio Art Seminar
    - Studio Art Workshop
    - Advanced Studio Art
- Design and Engineering
    - Design and Engineering Workshop
    - Advanced Design and Engineering Workshop
    - Creative Computation
- Performing Arts
    - Drama Studies
    - Music Theory and Practice: Instrumental (Intro)
    - Music Theory and Practice: Instrumental (Intermediate)
    - Music Theory and Practice: Vocal (Intro)
    - Music Theory and Practice: Vocal (Intermediate)
- Humanities
    - World Literature: English
    - Advanced Writing in English
    - Advanced Writing in Portuguese
    - Journalism: Theory and Practice
    - Philosophy
    - Business Strategy
- Mathematics
    - Calculus
    - Advanced Calculus
    - Statistics
    - Statistics and Data Science
    - Funções, Probabilidade, e Análise de Dados (FPAD)
- Science
    - Advanced Chemistry
    - Advanced Biology
    - Advanced Physics (algebra-based)
    - Calculus-Based Physics
    - Conservation Science
- World Course: Brazilian Social Studies and Geography
    - Advanced Humanities: People, Culture, Politics in the World
    - Advanced Humanities: People, Culture, Politics in Brazil
- Mastery
    - Mastery Workshop
    - Mastery Seminar 12
    - Apprenticeship 12

Global Electives (Online)

- AI, Society, and the Future 1
- Astronomy
- Becoming Einstein
- Business Strategy
- Eastern Civilization
- Film and Animation
- Introduction to Coding and Computer Science
- Inventions that Changed the World
- Masterpieces of Antiquity
- Philosophy
- Psychology
- Secrets to a Powerful Memory
- Warriors, Queens, Intellectuals

Avenues São Paulo Academic Electives (Live, In Person)

VISUAL ARTS AND DESIGN

Studio Art Seminar

With a focus on hands-on art practices and both traditional and contemporary materials and processes, this semester-long course aims to explore the fundamentals of art. Students will immerse themselves in a routine of an authentic studio practice as they experiment with a wide variety of mediums, such as pencils, charcoal, ink, watercolor, gouache, acrylic, collage, among others, to investigate the elements of line, shape, textures, values and colors. The course will also include discussions of relevant works of art from past and present. Students will also actively engage in critique sessions of the work of their peers and guest artists will serve to inform, inspire, and provide fresh perspectives.

Studio Art Workshop

Studio Art workshop provides students the opportunity to dive deep into a particular aspect of the visual arts. Technical skill, self-critique, and collaboration are emphasized throughout the course.

In 2022-2023, Studio Art Workshop will center on the medium of picture books. With few or no words, their illustrations function as visual text. Throughout the elective, students will learn about visual communication and the art of illustration and, by the end of the semester, will produce a publishable picture book. This course is designed for students with a strong interest in illustration and storytelling. A wide variety of mediums such as pencils, pen and ink, printmaking, acrylics, pastels, charcoal, collage, and digital tools will be explored. Students will be exposed to countless inspiring examples of great illustration, which will provide the rich and diverse world of picture books, enriching their visual vocabulary and providing a methodology to transform written stories into visual ones.

Advanced Studio Art

Culminating with a final exhibition, Advanced Studio Art provides the community, structure, and space for student artists to pursue their own creative work. Students may choose to explore hands-on art processes such as drawing, painting, sculpture, and mixed media. Digital media artists (including those working with animation, photography or film) are also encouraged to consider this elective course. No matter their medium, students taking this class are expected to be thoughtful, independent, dedicated artists who are prepared to bring their own personal interests and experiences to their artwork. Group critiques, research in contemporary art, readings and documentation of the creative process are also major elements of the course.

DESIGN AND ENGINEERING

Design and Engineering Workshop

How can 21st century tools be utilized and combined to solve real-world problems in a sustainable, useful and unique way? This design and engineering elective asks students to assume the mindset of a designer/engineer to identify everyday problems in school, their own lives, or the lives of others that can be solved with a physical or digital product. They will research and analyze existing solutions, fabrication techniques, and materials and work both collaboratively and individually to plan, design, build and test new solutions. Students in this studio will be self-directed and expected to identify and learn the skills needed for their projects with the support of their teacher and fellow students. This course is constructed so that students with varied levels of experience can learn the new skills they individually need while building upon and advancing the skills and techniques they already have from previous experiences within and outside Avenues.

Advanced Design and Engineering Workshop

How can 21st century tools be utilized and combined to solve real-world problems in a sustainable, useful and unique way? This design and engineering elective asks students to assume the mindset of a designer/engineer to identify everyday problems in school or their own lives that can be solved with a physical or digital product. They will research and analyze existing solutions, fabrication techniques, and materials and work both collaboratively and individually to plan, design, build and test new solutions. Students in this studio will be self-directed and expected to identify and learn the skills needed for their projects with the support of their teacher and fellow students.

In this Advanced Design and Engineering elective, new concepts and techniques will be introduced, such as how to design and create PCBs (circuit boards), analise and build bigger machinery, and understand how 3D printers and laser cutters work at a deeper level to build our own machines. Throughout the course, mathematical modeling and the use of more advanced software will be introduced with deliberate application to solve real life problems

Creative Computation

The program of this course aims to take a deep dive in the universe of computer science through the lens of arts and design. We will navigate through different software and hardware to 1) create interactive pieces of art, 2) design games that can be played physically, including those including sensors, and 3) rethink the use of new technologies to improve people's lives in different areas.

The course will be organized in 1) *coding challenges*, where new computer science concepts will be presented, discussed and deepened by the students, 2) *game design challenges* where students will apply their knowledge to build their own projects, and 3) *design challenges* where students will identify local and global problems and propose design solutions to meet these needs and challenges.

PERFORMING ARTS

Drama Studies

To operate well in the world we need to understand other people and different perspectives, whilst being able to effectively express who we are. Studying drama is an invitation to stretch how we think, feel, and communicate.

This practical workshop-based elective connects storytelling through drama across cultures. Working with classic texts, improvisation, and a variety of theater styles, students will expand their creativity, deepen their powers of empathy, and supercharge their public speaking. With a focus on learning by doing, there will be several opportunities to create, write, and perform; sharing what is produced with the Avenues community and beyond.

Music Theory and Practice: Instrumental (Intro)
Prerequisite: None, but the desire to learn and develop

Music Theory and Practice: Instrumental (Intermediate)
Prerequisite: Some experience with instrumental - either solo or group

This class meets in a workshop setting, providing musicians an environment in which to patiently develop technical mastery of their instruments through in-depth exploration of a wide variety of musical genres, including Brazilian music, American R&B, Afro pop, contemporary art music, indie rock, blues and jazz, in addition to music suggested by students themselves. The class focuses above all on nurturing the skills needed to play music by listening, singing and playing. While the elements of musical literacy are addressed, equal attention is paid to expression and creativity.

The ensemble is not limited to traditional symphonic band and string instruments but is open to all instruments including keyboards and guitars. (Keyboard players may use instruments provided by the school; guitarists should bring their own instruments to class.) Drummers are given the opportunity to work both on a full kit and with a variety of world percussion instruments. In addition, all ensemble members participate in Brazilian, African, and Afro-Caribbean drumming as an integral part of the ensemble's rhythmic development.

Music Theory and Practice: Vocal (Intro)
Prerequisite: None, but the desire to learn and develop

Music Theory and Practice: Vocal (Intermediate)
Prerequisite: Some experience with voice - either solo or choir practice

Each one of us has a unique voice that communicates our story and shows our personality. This program seeks to help students find their voice, develop their technique and express their true selves with artistry and confidence.

Both the Intro and Intermediate courses provide students distinct and complementary opportunities to grow as vocalists. At times, students will join ensembles and collectively learn how to collaborate musically. The repertoire will be varied and according to the students level and interest. At other moments, students will participate in masterclasses, selecting their own repertoire with the teacher's guidance to grow as vocalists through personalized techniques.

HUMANITIES

In the humanities, students move between World Course and language classes, yet their studies can originate from a single, integrated project, issue, study of phenomena or theme. By reading across a range of genres from historical texts to traditional literary texts, students come to appreciate a full understanding of literature in context.

World Literature: English

This course continues the development of students as readers, writers, speakers and listeners by providing opportunities to refine the skills introduced and advanced in previous courses. Our study will include a focus on various genres, especially as they inform and are informed by style and structure. Texts will continue to be drawn from those voices that encourage engagement with contemporary issues and will originate from global perspectives. Writing assignments will allow students to exercise their creativity as well as their analytical skills and may range from poetry and short stories to personal and analytical essays.

Advanced Writing in English

This course explores language as an art form while asking what it means to be an artist whose medium is words. Through this elective, students will develop the habits of mind necessary to grow as creative writers. Students will read literature as writers, emulate points of craft, and experiment in prose and verse. In this workshop-centered course, all writing will be centered on an awareness of craft, structure, form, aesthetics–and to the practice of sharing generous and constructive peer feedback.

Advanced Writing in Portuguese

The proposal of this elective course is to leverage Avenues students' reading and writing skills in Portuguese to the college level. It affords them the opportunity to deeply study literary works of universal literature and use them as an object to write an academic paper following the format expected by Brazilian universities. They will be able to recognise the structure of an argumentative paper (title, summary, keywords, introduction, development, conclusion and theoretical references) and apply it to their own original work. Via an inquiry-based approach, they will connect personal observations on a literary work to important issues of the contemporary world.

Journalism: Theory and Practice

This course explores journalism as a force for communication, democracy and change. It asks how professional publications—newspapers and magazines and student publications act as public forums for expression and leading voices in the free and open discussion of ideas.

Students study journalistic principles and develop essential journalistic skills in research, inquiry, reporting and writing for a publication. Students discuss hot-button issues in the field; conduct research; and gather, process and disseminate relevant news. In weekly journalism roundtables, students workshop their feature articles, op-eds, essays and human-interest stories while weighing the principles of truth, accuracy, objectivity, impartiality, accountability and fairness.

Philosophy

Does life have (a) meaning? Why do we think the way we do? How does the world we live in affect who we are and the decisions we make? In a moment in which high school students find themselves making important life choices and facing worldwide dilemmas, this elective aims at discussing how the way we perceive and navigate reality can have an impact on how the future might be. Via an inquiry-based approach, each one of them will be invited to connect the reflections made during the course with their own future, as well as consider the practical application of the skills and knowledge acquired in it on their academic life, job market, political realm, and personal lives. The skill foci in this elective include the development of systematic analysis of texts and videos, as well as a further development of critical thinking and discussion skills.

Business Strategy

This business and economics course presents a comprehensive examination of successful business practices to students. The course posits how to demystify the secrets of business through an analysis of the five disciplines-strategy, operations, finance and accounting, organizational behavior, and marketing commonly taught in college or graduate-level business programs.

Philosophy Practicum

As an extension from the Upper Grades Philosophy elective, Philosophy Practicum provides Grade 12 students the opportunity to take theory and practice to the next level. Through the exploration of topics, philosophers, and theorists typically explored at the university level, students will dive deep into how philosophy interfaces with the world around them, interrogating the foundations of morality, politics, religion, commerce, and society itself with the mind of a philosopher.

An integral aspect of the course will be the opportunity for students to connect philosophical theory to practice, dedicating a significant portion of the course to action research, community service, or other proactive project that highlights the interplay between what we believe in the world and how it can impact change, providing tangible evidence of how philosophy can lead to individuals "practical in the ways of the world".

MATHEMATICS

Functions, Probability, and Data Analysis

Note: Only available Semester 1
Prerequisite: Successful completion of Integrated Math 4

This senior-level course focuses on a continuation of the study of functions that motivate real-life growth and decay problems. More complex problems with trigonometric, exponential and logarithmic functions connect geometric, algebraic and these transcendental functions. These topics move naturally into modeling data sets with regression equations. The zero-residual line and least squares line are discussed initially followed by logarithmic transformations of data. This course ends with a data analysis project that students integrate with other projects they are doing within their course of study at Avenues.

Funções, Probabilidade, e Análise de Dados (FPAD)

Note: Only available Semester 2
Prerequisite: Successful completion of Integrated Math 3

This Portuguese-language math elective is designed for juniors and seniors intending to stay in Brazil and take the vestibular. FPGE meets every day, allowing students to extend beyond what can be covered in traditional after-school vestibular prep sessions. The course will consist of problems from different vestibulares and others that are deemed most important to Brazilian universities, while concurrently maintaining a discussion-based approach typical to Avenues.

Statistics

Note: Only Available Semester 2
Prerequisite: Successful completion of Integrated Math 3

This inquiry-driven course provides students with opportunities to build a conceptual foundation of the important concepts in the fields of Statistics and Data Science. Through inquiry and experimentation, students will learn about statistical tools & methods, types of bias, sources of error and limitations, probability concepts, and the elements of different types of statistical studies (experiments, surveys, observational studies). Students will utilize digital tools to collect, organize, and clean sets of data, analyze patterns and trends, and share their findings.

Statistics and Data Science

Note: Only Available Semester 2
Prerequisite: Successful completion of Integrated Math 4 STEM or Enrollment in Grade 12

The ability to work with, understand, and use data has become an essential life skill and requirement for an ever-expanding range of jobs and careers. This new data intensive world can be difficult to navigate; decisions that used to be straightforward are now more complex, requiring individuals to be constantly separating fact from fiction. In short, the need to analyze and interpret data is no longer confined to engineering or computer programming; it has become an essential life skill.

This course introduces students to the idea of data, measurement of data and creating and interpreting different representations of data. Students will explore real data and the idea of Big Data from the internet and how it relates to decision making. Further, regression and modeling of data will be an important aspect of this course. This is followed by probability, bivariate data and the basics of the normal distribution in order for students to learn to evaluate claims and make connections about trends in data.

This course is appropriate for students who are interested in statistics, psychology, journalism, and other humanities-based courses of study.

Introduction to Calculus
Note: Available Semester 1 and 2
Prerequisite: Successful completion of PreCalculus -or- successful completion of Integrated Math 4 G or S

This problem-based course begins by looking at the trigonometric functions on the coordinate plane as well as their inverse functions. Further study of functions includes exponential and logarithmic functions and their inverses along with the relationship between these. Students will then collectively and individually build a solid conceptual foundation for the study of calculus by investigating average and instantaneous rate with these functions as well as the concept of the limit. Later in the semester, the derivative function will be applied to such topics as differentiability, continuity, related rates, implicit differentiation, optimization and graphical analysis. Depending on time, slope fields, separable differential equations and the Fundamental Theorem of Calculus may also be discussed.

Calculus
Note: Available Semester 1 and 2
Prerequisite: Successful completion of Intro to Calculus -or- successful completion of PreCalculus, supplementary break work, and teacher recommendation

This course is meant for students who are particularly motivated and interested in studying the mathematics of a rigorous Calculus course. These students might be interested in moving into STEM fields as they consider their future college studies. This course starts the Avenues PBL Math Book IV which begins with a deep dive into new material like Polar Coordinates, periodicity of functions, asymptotic behavior of rational functions, complex numbers and infinite geometric series. Threaded in with all of this new material is a more rigorous view of instantaneous rate of change at a point in time and students become extremely familiar with this concept and start to see patterns in these rates. This begins the formal study of differential calculus which continues throughout the year, including early transcendentals. The derivative functions are then applied to such topics as differentiability, continuity, related rates, implicit differentiation, optimization and graphical analysis. Depending on time, slope fields, separable differential equations and the Fundamental Theorem of Calculus are also discussed.

Advanced Calculus
Note: Only available Semester 2
Prerequisite: Successful completion of Calculus -or- Intro to Calculus plus supplementary break work reflective of the rigorous content of this advanced course

This Advanced Calculus course is designed for students with an extremely-high commitment level to rigorous and fast-paced mathematics coursework. Students will complete all of the content of the Avenues' Calculus class previously described, before moving onto slope fields, separable differential equations, and curvature of functions with normal lines. Differential equations lead into the concept of the antiderivative, which directly leads to Riemann Sums, the definite and indefinite integral and the Fundamental Theorem of Calculus. The remainder of the course concerns itself with additional integration techniques such as partial fractions and integration by parts, as well as continued applications of integration such as areas, volumes of revolutions, and cross-sectional volumes. Finally, the course ends with the calculus of parametric and polar functions, infinite series, and Taylor polynomials.

SCIENCE

Advanced Chemistry

Advanced Chemistry expands upon the foundations of physical science developed in earlier science courses. The course is designed for students to attain a more in-depth understanding of the structure and properties of matter, chemical reactions and thermochemistry. The concept of the conservation of mass and energy is developed more quantitatively. Students apply their understanding of periodic trends to predict the products of a reaction. The nuances of the different types of reactions are explored through laboratory investigation.

Advanced Biology

With the discovery of the structure of DNA, the sequencing of the human genome and the advent of biotechnology, molecular biology increasingly affects our understanding of the underlying principles of biology. This course builds on previous knowledge to help foster a broad understanding of biological concepts. Major areas of study include the chemical basis of life; cells; similarities and differences in living organisms; evolution; reproduction; and genetics. Major themes are homeostasis; the relationship between structure and function (on both macroscopic and microscopic levels); division of labor; and the evolutionary adaptations of various organisms. Emphasis is placed on the analysis of data generated through lab activities.

The course is intended for students who have exhibited consistent and high proficiency in previous science coursework and have been recommended by a science teacher for advanced study.

Advanced Physics (Algebra-Based)

Advanced Physics students build upon the foundations of physics from previous science courses to delve more deeply into understanding mechanics, electricity and magnetism, waves and optics and modern physics. Each term focuses on one main idea, including lab design and experimentation, as well as a more rigorous approach to using equations to model complex systems. We begin with a study of projectile motion and two- and three-dimensional mechanics. In electricity and magnetism, we build on the understanding of these systems to study more complex circuit design and apply knowledge of induction to designing motors and other applications.

Our waves and optics unit focuses on geometric optics and light refraction, as well as serving as an introduction to modern wave equations like the Schrodinger equation. Finally, we take a full term to study introductory modern physics, including a study of the development of quantum mechanics as both a model and a way of thinking about the universe.

Calculus-Based Physics

Prerequisite: Current or past enrollment in Intro to Calculus, Calculus, or Advanced Calculusl

This course is equivalent to a one-semester, calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in physical science or engineering. The course combines a depth of knowledge in physics with a significant mathematical study of calculus and how it applies to our physical laws and models of the universe. The mechanics segment of the course explores topics in kinematics; Newton's laws of motion; work, energy and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation. The electricity and magnetism segment of the course explores electrostatics; conductors, capacitors and dielectrics; electric circuits; magnetic fields; and electromagnetism. The course is mathematically rigorous and includes a laboratory component as well. Introductory differential and integral calculus is used throughout the course.

Conservation Science

Conservation science is the study of the natural sciences in an interdisciplinary context that includes consideration of people and how they have influenced various systems around us. Fostering an explorer mindset, this course is designed for students who wish to study topics related to the environment, its natural resources and sustainability.

It emcopasses many aspects of ecology, earth and atmospheric sciences, animal and human population dynamics, and an appreciation for the Earth and its natural resources. It will cover topics such as biodiversity, energy and cycling of matter, stability and change in ecosystems, and human activities and technology on ecosystems. Tropical deforestation, climate change impacts, disappearing species, eroding genetic diversity within species are concerns tackled by the subject. Finally, the use of economics to understand the costs and benefits of sustaining natural ecosystems (Conservation Economics), will provide guidelines to support decision-making and problem-solving skills for our students. Due to the rapid decline of established natural systems around the world means that conservation science is often referred to as a "Discipline with a deadline.''

WORLD COURSE

Brazilian Social Studies and Geography

The World Course program in grade 12 is part of an intensive, interdisciplinary program linked to the Global Studies humanities program. The 12th grade World Course investigation will utilize a variety of historical, sociological, anthropological, economic, scientific and statistical lenses to identify common patterns and trends over time as they relate to current day and future global phenomena.

Em ambas as séries, a Geografia é um importante suporte para a compreensão do espaço político e socioeconômico em diferentes tempos, tanto nos temas referentes à História do Mundo, quanto naqueles que discutem os processos geopolíticos e históricos relativos ao Brasil contemporâneo.	In 11th and 12th grade, the study of geography is critical to understanding political and socio-economic forces. Students will consider the role of geography in different periods of world history, as well as those that eventually shaped Brazil as it is today.

Advanced Humanities: People, Culture, Politics in the World

This elective course affords Avenues students the opportunity to study the world in which they live as they prepare to tackle future academic demands and expectations. The course aims to foster students' curiosity about the ways in which culture has developed over time, and encourage an understanding of its present and the pathways for the future by thinking critically about the past. In doing so, the elective empowers students that want to enrich their core knowledge and deeper conceptual understandings about the humanities via an inquiry based approach. Here students will engage in learning to answer thorny and debatable questions such as: Can we positively say that we still have democracy in the modern world as first envisioned by the Greeks? Have wars shaped the way humans organized the world?

Advanced Humanities: People, Culture, Politics in Brazil

Advanced Humanities uses Brazilian history and culture from the Discovery to the current challenges as the means to explore processes, philosophical areas of study, and societal changes at a deeper level. Major Brazilian thinkers in the Humanities along with Brazil's geopolitical challenges are but just two areas for in-depth inquiry. Thus, the course is not only an inquiry opportunity for students interested in different Humanities' fields but also a preparation for the next step in their academic life given the course's alignment to the rigors of the Vestibular.

MASTERY

γένοι ' οἷος ἐσσὶ μαθών
"Learn and become who you are." —Pindar, Pythian 2.72

As a cornerstone of the Avenues experience, the Mastery Program has one mission: To inspire a world of happier, more meaningful lives through the beautiful engagement of one's passions.

It is with this goal in mind that we provide students both time and space during the school day to strive towards the focused achievement of exceptional skill in a desired domain. If you are familiar with Fifth Term in the upper grades or Minimester in the middle grades, the Mastery Program is all that and more. Imagine a young historian researching a minor historical figure in order to add to the academic literature of this period, a team of young scientists working with college professors to harness the potential of radio waves to power small electronic devices, a budding entrepreneur launching a socially-conscious business, or a songwriter working with mentors to write and produce her first album. The possibilities are endless in Mastery, and our students' work is limited only by their imaginations.

Mastery Workshop

Prerequisite: Approved **Mastery Program Application** **[Deadline → Monday, June 6th]**

Note: This *one-period* elective is designed for Grade 12 students dedicated to self-directed work and provides tools to explore and refine personal project interests.

For those students who have demonstrated a commitment to their domain and who have been accepted into the Mastery Program at Avenues, Mastery Workshop exists as vital time and space within the regular school day to help students develop their knowledge, conceptual understanding, judgment and skill in a particular area. This is a unique opportunity for students to do passion-driven work under the watchful eye of a field expert who will act as both a mentor and a guide on this journey.

Students in Mastery Workshop may choose to work independently or in small teams on long-term interests in this space, whatever that interest may be: community engagement; humanities and literary arts; performing arts; science and math; sports; technology and engineering or visual arts. Students here will be granted common time with those peers who share similar interests in order to discuss their progress. Students are expected to maintain a Mastery portfolio throughout the year and may choose to work toward the completion of a Mastery project for inclusion in the end of year showcase.

Mastery Seminar 12

Note: If you are interested in the double-block Semester 2 Mastery Seminar 12, please stay tuned for news on the application process that will be distributed in Semester 1 of the 2022 - 2023 academic year.

As described in the Semester 2 Academic Program description above, this two-period intensive seminar is reserved for Grade 12 students who have already demonstrated evidence of self-directed project work and a particular, well-planned personal project in mind.

For those students who have chosen to pursue Mastery in some form over their years at Avenues, the senior-year Mastery seminar is the culmination of that journey. Seniors in this capstone class will dedicate two of their four academic elective periods to develop and present an original senior project to our community. Unlike Intro to Mastery and Mastery Workshop, students applying to Mastery Seminar 12 will begin the semester with a well-developed project idea from the outset. Students in this class will work closely with faculty, mentors and, potentially, experts in the field to help them dive deeper and more thoughtfully into their work.

In addition to focused project work, Mastery Seminar 12 emphasizes a deeper level of project planning, goal setting, reflection, and exploration of how their own creativity translates to the completion of a complex personal project. Applying what they learn from this exploration, our students will graduate from the Mastery Program with an expanded sense of self, an objective view of their work and an understanding that when they engage beautifully in their passions they have an ability to affect the world in positive ways. The Mastery Seminar is a pathway end point and an invitation to fulfill the mission of the Mastery Program: to inspire a world of happier, more meaningful lives through the beautiful engagement of one's passions.

Apprenticeship 12

Note: If you are interested in the double-block Semester 2 Apprenticeship, please stay tuned for news on the application process that will be distributed in Semester 1 of the 2022 - 2023 academic year.

Apprenticeships offer students the opportunity for Grade 12 students to extend their learning through hands-on work with an off-campus partner company or organization. Apprenticeships are:

- Skill-focused - Apprentices will learn job- / career-specific skills in the apprenticeship
- Part Time - Apprentices will still enroll in two different academic electives each school day of Semester 2.
- Authentic: Apprentices will autonomously participate in the program by working part-time and engaging in instructional activities to enhance their experience.

Avenues Global Electives

Overview
Global Electives allow students from across the Avenues ecosystem to take the same classes either in addition to or in place of a campus offering. Global Electives are an online adaptation of the Oxford tutorial model, which enable students to learn at their own pace and at various levels of difficulty in a broad range of subjects, and connect with peers across the Avenues ecosystem. Student work in Global Electives is completed asynchronously and accompanied by office hours, optional group discussions, asynchronous feedback, and student-driven projects.

Global Electives are full or semester-year, credit-bearing classes, which also afford highly-motivated students an opportunity to complete their required coursework before the end of the academic year. **9th–12th grade students can take one Global Elective *in place of* a campus elective per academic year.** Students who wish to take more than one Global Elective in place of campus electives in the same academic year should explore this decision in consultation with their dean.

Additionally, certain Global Electives may have Advanced options available for students who wish to go beyond the required skills, knowledge foundation and expectations for the class. Opting into the Advanced level can be done after enrolling in the course, contingent upon instructor approval and in consultation with the student's dean.

Note that as with any class, Global Elective courses will need to meet a minimum enrollment in order to run. Students who ultimately enroll in Global Electives will still report to the Avenues São Paulo campus for the regular school schedule of 8:00 - 15:45 and will have a dedicated time and space to complete their Global Elective coursework.

Global Elective Selection
Students interested in taking a Global Elective will use the same Course Preference Form linked at the beginning of this Course Guide.

Important Note:
Global Electives are designed for autonomous, proactive students with strong organizational capacity. The self-driven nature of the coursework provides both opportunity and responsibility. To ensure that students interested in Global Electives are set up for success, Avenues São Paulo Associate Division Heads and Deans will collaborate to review Course Preference Forms and, as needed, confer with students before approving or deferring their enrollment in Global Electives.

Global Elective Options (Online)

AI, Society, and the Future 1

A unique, interdisciplinary approach to AI, this class combines learning the technical skills of AI programming with developing sophisticated perspectives on the past, present, and future of this emergent technology and its inevitable ethical ramifications. Applied projects such as classification, recognition, and prediction are complemented by the foundational science fiction and non-fiction texts for artificial intelligence. Students will finish the class with a robust portfolio of projects and be prepared for more advanced levels in the future.

Astronomy

Students will survey the main concepts, methods, and discoveries in astronomy, such as the constellations drawn by the ancients, the latest reports from planetary probes in our Solar System, and the most recent images offered by telescopes probing the farthest frontiers of space and time.

Becoming Einstein

When one begins to look at the life of Albert Einstein—his childhood, his friends and colleagues, his education, his incredible accomplishments—one very quickly discovers that he led quite an extraordinary life. What made Einstein's life so extraordinary? In this course, we will take a close look at this question with an eye toward discovering what lessons might be learned and applied to your own lives. Activities and provocations centered on the most striking aspects of Einstein's life will present you with the opportunity to shape the way you organize your life, your thinking, your creativity, and your practice. You will engage with Einstein's core world-views, scientific thought experiments, and paradigm-shifting accomplishments ranging from his extraordinary original proof of the Pythagorean Theorem to his laser-sharp work supporting the existence of atoms to his most astounding and beautiful work in general relativity.

Business Strategy

The business and economics course presents a comprehensive examination of successful business practices to students. The course posits how to demystify the secrets of business through an analysis of the five disciplines of strategy, operations, finance and accounting, organizational behavior, and marketing commonly taught in college or graduate-level business programs.

Eastern Civilization

Learn about the origins of East Asian civilization in this humanities course that explores the history of China, Japan, Korea, and Southeast Asia. Throughout the course, students will explore the significant accomplishments of Eastern civilization, from the material economy of day-to-day life to the political and religious philosophies that would bind Eastern cultures together for thousands of years, with Foundations of Eastern Civilization.

Film and Animation

Film represents one of culture's most influential art forms, merging disciplines as diverse as photography, painting, sculpture, performance, music, and writing. This year-long elective examines film's building blocks to understand better the relationship between sound and image in generating meaning. Students will develop their moving image practice by creating a series of live-action and animated short films. They will engage in all steps of the process, from idea generation to pre-production planning, from shooting to primary production, and editing skills to bring their cinematic ideas to life. Film and animation are powerful forms of visual communication and expression, and students will be encouraged to bring both creativity and intentional decision-making to their work.

Introduction to Coding and Computer Science

In this coding course, students will build their skills in Scratch and Python through the completion of practice activities, emulations, and authentic projects. Possible projects that students will take on include creating virus behavior simulations, random math problem generators, image processing and modification, and a variety of games. The project types are suitable for various abilities: beginners will gain foundational skills, and more advanced students will challenge themselves with additional functions and constraints.

Inventions that Changed the World

In this course, students will learn about the remarkable stories surrounding momentous inventions and how consequential these inventions were in history. From prehistoric times to the 21st century, inventions have changed the world, enabling humans to produce more food and energy and establish social order and cultural meaning. In fact, great inventions have marked several key turning points in human history, transforming society and our daily lives—understanding how these inventions have changed and shaped our world.

Masterpieces of Antiquity

Learn about great masterpieces of antiquity and prehistory in this visually rich course that travels around the world, highlighting stunning works of art from ancient cultures. Engage in a journey worldwide to see some of the greatest works of art ever created and explore the cultures that made them.

Philosophy (Global Elective)

Note: Students interested in taking the online version of Philosophy should select "Philosophy (Global Elective)" in the Course Preference Form. The in-person elective that takes place on the São Paulo campus is simply titled "Philosophy".

We have all pondered seemingly unanswerable but significant questions about our existence. There is no better way to study the big questions in philosophy than to compare how the world's greatest minds have analyzed these questions and reasoned out potential solutions. The final step is always deciding for yourself whether you find an explanation convincing. In this course, you will be introduced to and learn to think clearly, identify misconceptions, and reach your conclusions as you confront the questions that have puzzled generations of philosophers.

Psychology

From Freud to mapping brain activity, explore the fascinating world of psychology and its complex history. This class focuses on both human behavior and neurology, beginning with social psychology and extending to how the brain works and how signals are transmitted into the body. Significant topics include behaviorism, sensation and perception, muscle movement, processing, measuring neural activity, and the factors that affect the transmission of nerve signals.

Secrets to a Powerful Memory

Take a voyage into the human mind to discover how the various aspects of your memory operate. Uncover the different systems that make memory possible, how these systems work together, how the various elements of your memory operate, and the impact memory has on your daily experience of life with memory and the human lifespan.

Warriors, Queens, Intellectuals

View history through the stories of 36 women who changed the world with their ideas, leadership, and sacrifices. In unearthing these stories in Warriors, Queens, and Intellectuals, we can rediscover the contributions of women—often lost to time and whose stories were written to fit prevailing prejudices—but we can also see our own history in new, more nuanced ways. Beyond battles and dates and the names of great men, there are other stories that can give us a richer understanding of the past and how it has shaped the world we live in today.

Grade 12 Course Selection Guide

Preparations for the Grade 12 Course Selection Session on Monday, June 6th

Step 1: Reference the tables below to **identify the Grade 12 courses that will be offered** in the 2022 - 2023 academic year.

Semester 1

Avenues São Paulo Academic Electives (Live, In Person)

Grade 12 Math *Choose 1*	Functions, Probability, and Data Analysis	Intro to Calculus	Calculus	
Senior Seminar *Choose 1*	The Artist's Studio	Communications	Entrepreneurship + Social Innovation	Science + Engineering

Semester 2

Avenues São Paulo Academic Electives (Live, In Person)

Period 1	Period 2	Period 3	Period 4
Advanced Biology Advanced Calculus Advanced Humanities: World Advanced Writing: English Advanced Writing: Portuguese Business Strategy Design and Engineering Workshop Intro to Calculus Journalism: Theory and Practice Music Theory / Practice: Instrumental (Intro) Music Theory / Practice: Vocal (Interm) Statistics Studio Art Workshop	Advanced Chemistry Advanced Humanities: World Advanced Physics Calculus Creative Computation Drama Studies FPAD em Português Mastery Workshop* Music Theory / Practice: Instrumental (Intermediate) Music Theory / Practice: Vocal (Intro) Statistics and Data Science Studio Art Seminar World Literature: English	Adv. Design + Engineering Workshop Advanced Humanities: Brazil Advanced Writing: English Calculus-Based Physics Conservation Science	Advanced Calculus Advanced Studio Art Advanced Writing: Portuguese Calculus Philosophy Practicum
		Academic Pathway 2 Double Block of Mastery Seminar 12** **Academic Pathway 3** Double Block of Apprenticeship 12** *** Applications will be released in Semester 1 of Grade 12.*	

** Requires approved Mastery Program Application*

Avenues Global Electives (Online)

Grade 12 students may take one (1) Global Elective in place of one of the Semester 2 electives in the chart above (pending ADH / Dean approval)

1. AI, Society, and the Future 1
2. Astronomy
3. Becoming Einstein
4. Business Strategy
5. Eastern Civilization
6. Film and Animation
7. Introduction to Coding and Computer Science
8. Inventions that Changed the World
9. Masterpieces of Antiquity
10. Philosophy
11. Psychology
12. Secrets to a Powerful Memory
13. Warriors, Queens, Intellectuals

Step 2: **Select your course preferences** for both Semester 1 and Semester 2.
Note: You will complete this step on campus with the guidance of ADHs and Deans on Monday, June 6th.

- Semester 1 Course Selection
  - **Select your Grade 12 Math course.**
    - You will be automatically enrolled in Programa Brasileiro during the other period.
  - **Select your preferred Senior Seminar**.
- Semester 2 Course Selection
  - **Select your top 3 preferences** for **all 4 class periods**.
    - Even students interested in a double-block of Mastery Seminar 12 or Apprenticeship 12 should select preferences for Periods 3 and 4; applications for those programs will be shared next Semester.