

2023 SEG EVOLVE PROGRAM

Frequently Asked Questions

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What does SEG EVOLVE stand for?

- Experience-Based Learning Program – Mentor guided.
- Value – Outcome-driven, critical thinking within a business context.
- Online Collaboration – Interdisciplinary teams, appreciating diversity.
- Leading Edge Technologies, workflows, and industry experts.
- Versatile – Meet contemporary challenges with integrated solutions and methodology.
- Environmentally, technically, and professionally sound, addressing O&G, carbon mitigation, geothermal, underground water, and mining.

What is SEG EVOLVE?

SEG EVOLVE is a mentor-guided virtual internship with multidisciplinary teams to build foundational knowledge by integrating technical and commercial data for business decisions, a recipe for career success.

The program includes exploration workflows, subsurface characterization, economics and business management training that can be used in oil & gas exploration/development, carbon storage projects, geothermal energy and other applications that require integrating geology, geophysics, petrophysics, engineering, business, and communication skills.

The program emphasizes global solutions for application to the world's energy needs enabling two branches: Subsurface Characterization and Carbon Solutions.

SEG EVOLVE experiential learning program is targeted to undergrad and graduate students looking to learn a practical approach on how to solve the never-ending challenges and perspectives of current energy and environmental business missions through the dynamics of a multidisciplinary team.

Project management, teamwork skills, and business values are honed within the context of exploration, reservoir appraisal, field development planning, and production enhancement and carbon mitigation scenarios. The program also links experienced Mentors to student teams, empowering the participants to solve the types of realistic challenges and communicate recommendations to the complex audience the students will encounter when they start working.

SEG EVOLVE consists of applied investigations that have no prepared answers. The emphasis for students is to propose solutions using available data to think carefully and ask the right questions. Students, regardless of their level at the start, can expect to be continuously challenged and to see significant improvement in their business and technical skills.

The program also provides access to experienced volunteer Advisors, empowering the participants to help solve the types of realistic challenges that students will encounter when they start working. **Even with the data, resources, and mentoring that SEG will provide, it is expected teams to seek the support of their Faculty Advisor and use them as one of their primary resources. In the past, teams that made the most of SEG EVOLVE were those that had the most engaged local Professors.**

SEG EVOLVE is managed by the Technical Coordinator, and the SEG EVOLVE Program Manager. Participants will receive regular communications from the support team concerning the technical and logistical aspects of the program.

Who can participate?

Students and university-based teams are welcome to apply, including Masters, Ph.D. from Geoscience, Engineering, Environmental and Business programs, and 3rd and 4th year undergraduate students participating in geoscience and engineering programs.

For the *SEG EVOLVE Subsurface Characterization Program*, **No more than half of the team should consist of 3rd/4th year BS students** (based on a 4/5 year program accordingly). Teams typically consist of 4 to 6 individuals and must include a variety of disciplines - geology, geophysics, petrophysics, rock physics, reservoir engineering.

For the *SEG EVOLVE Carbon Solutions Program*, the team should be comprised of graduate program students. Teams typically consist of 6 to 9 individuals covering the essential range of discipline knowledge from- geology, geophysics, petrophysics, rock physics, engineering (reservoir, drilling, simulation, chemical, etc.), environmental science and business/communication.

We are targeting participants with less than 5 years of industry experience or someone seeking to switch fields (for example well logger, seismic processor, and others) enrolled in graduate programs to gain complementary experience in subsurface characterization or carbon storage.

We have found that students that have previously participated in AAPG's Imperial Barrel Award (IBA) tend to be more successful in SEG EVOLVE and therefore encourage each applying Team to try to include at least one IBA "graduate." Since SEG EVOLVE requires a significant and steady time commitment over 6 months, we strongly discourage any student from attempting to participate simultaneously in SEG EVOLVE and AAPG's Imperial Barrel Award.

What makes SEG EVOLVE unique?

The participating teams will engage in many technical activities equivalent to those an early career professional will execute during the first three years of experience. SEG EVOLVE is about collaboration not competition, not just within your own Team, but across Teams. After completion of SEG EVOLVE 2023, the names of the individuals that have satisfactorily and successfully completed the Program will be listed on the SEG website (affectionately referred to as "The Wall of Fame").

A unique aspect of SEG EVOLVE is that we choose investigations for which no one (not even the most experienced mentors) has all the answers and how to make qualified recommendations using all the available yet limited data. SEG EVOLVE will not be about teaching facts and knowledge because participants have other resources in place to help with those items. To the contrary, you will experience real life industry challenges and will learn to draw conclusions and make decisions with available information.

The SEG EVOLVE 2023 Teams will be chosen from around the globe, and work together with individuals from different backgrounds with different “first-languages” and perspectives of the world. English will be the practical language of SEG EVOLVE, but what we found in previous years is that effectiveness requires flexibility, where shifting to other languages facilitate communication and comprehension.

Building language skills and understanding different becomes an additional experience based learning from SEG EVOLVE and one of the strongest competitive advantages one can immediately apply in any industry career path.

Is this a competition?

No. This is a collaborative program, and we strongly encourage teams to interact and engage with other SEG EVOLVE teams. However, technical standards and business expectations will be conveyed, with every team receiving focused, critical and timely feedback from industry and academic technical advisors and geoscience professionals.

What are the key SEG EVOLVE Milestones?

Because SEG EVOLVE is intentionally designed for students and Mentors to jointly go into the unknown, no two SEG EVOLVE Projects or experiences are ever the same. Nevertheless, there are some common elements in any given year and some of the key Milestones are the following:

SEG EVOLVE Programs:

- The Program starts with a **Kickoff Meeting (KOM)** where all teams meet and learn about the objectives and deliverables for the program. Team Leader will introduce the team. A slide with the **Name of Team, Team Member Pictures and Roles** will be required. This meeting usually takes between 2-3 hours (depending on number of accepted teams) and is led by the Technical Coordinator, supported by other Advisors and SEG staff.
- **Global Team Meetings:**
These will take place **weekly with the Technical Coordinator and Advisors** and include:
 - **SEG EVOLVE orientation, including Basecamp introduction** (online software for program management and communication).
 - **Just in Time Lectures** to develop appropriate knowledge and software skills to enable the team to execute their work.
 - **Team’s presentations** distributed as 10 minutes to share work progress and 5 minutes for advisor’s feedback & Q&A. Other teams’ participation, approaches, and discussions will be exposed in this meeting enriching each team individual knowledge. Open discussion is encouraged. This has been one of the key learning environments in previous years.
- **Mid-Project Presentation** (manager’s presentation) focused on demonstrating technical work progress, usually attended by an Executive Committee consisting of 5-10 senior Advisors.
- **Final Recommendation Project Presentation** (Supporting Investment decision with technical, economic, business and ESG considerations)

attended by the Executive committee.

- **You will have the opportunity to condense and fine tune your presentation to 20 minutes with a focus towards an audience of investors. This presentation will be recorded for potential presentation at a conference related to your project.**

Additional milestones will be defined as the project advances.

All Teams will work with various software Tools while implementing the Curriculum and will be expected to already be familiar with those tools or learn to use them with the provided online materials. Those who are not familiar with the use of their Team's multi-disciplinary software should plan to spend approximately twice the number of hours participating in SEG EVOLVE as those already familiar with the software. This added investment is likely to pay off given that most employers consider the knowledge of modern software to be strong plus.

Project management software Basecamp will be made available at no charge to all participants and will provide an easy way to communicate with a wide range of Mentors and other Teams.

To function effectively in SEG EVOLVE, including the Global Team Meetings using Zoom, you will need to have a consistent and high-speed Internet for virtual meetings and software. We strongly recommend that you use a hard-wired Internet connection and have at times found that those who do not get dropped in the middle of their communications.

Plans may be made for team representatives to attend a conference with each team being responsible for preparing a 20-minute PowerPoint presentation and a Poster Paper illustrating their "Best Investment Opportunity."

Is there a cost to participate in SEG EVOLVE?

The SEG EVOLVE program includes support from a capable technical team and industry mentors who invest considerable time and resources to ensure a quality educational experience for participants. As a demonstration of participants' investment in their own learning, we require a \$50 team fee for all teams invited to participate in 2023, payable by 31 December 2023 for Subsurface Characterization & 1 August 2023 for Carbon Solutions. We will consider the option to waive the fee for a very limited number of teams who can demonstrate in writing that they are unable to make the payment.

What are the team requirements to participate?

Each team requires and will recruit its own Faculty Advisor, based at its university. In addition, the SEG will make available coaches and/or industry advisors who can provide the team technical guidance. The SEG will also identify subject matter experts in various areas as resources for all teams. **All team members must be members of SEG by the time the SEG EVOLVE 2023 program begins.**

Limited funds are available to cover the membership fee for students who are unable to pay. For more information on SEG membership, please visit the website at <https://seg.org/join>.

You can verify your membership online at SEG.org and login to your account. In the “My Account” section you will see your membership status, it should say “Active” and “Student.” If you do not have an active student membership, please contact members@seg.org to complete your membership application.

As this program is designed around teams and not datasets, the exact makeup of any one team is not prescribed by the SEG. Team participation is not country dependent - **team members do not have to reside in the same city or country**. However, the SEG strongly recommends teams be based in the same hemisphere.

Each team is required to have AT LEAST one geologist, one geophysicist/rock physicist, and one Reservoir Engineer (a geologist or geophysicist who has had a petroleum engineering course or experience counts). Below are general guidelines for technical skills suggested for various team members as well as a summary of the activities and efforts required:

- **Geophysicist** – seismic interpretation, well synthetic/well tie, seismic stratigraphy, seismic modeling. Previous hands-on experience in using a modern workstation to perform typical geophysical interpretation activities is a strong plus. Will be expected to be mapping and interpreting continuously and to be sharing examples of progress at regular meetings
- **Geologist** – seismic interpretation, well log correlation, stratigraphy, basin modeling, well log interpretation. Previous hands-on experience in using a modern workstation to perform typical geological interpretation activities a plus. Will lead the efforts in the geological literature search and review as well as gathering relevant shapefiles, loading and analyzing them in GIS software and sharing those files with teammates working in the integrated workstation. Will need to understand the petroleum geology of assigned areas with an emphasis on the likely distribution of source and favorable reservoir facies. Will be expected to be working continuously and be updating team mates on key findings, as well as environmental impact and mitigation that influence their activities in the project.
- **Reservoir Engineer** – decline curve analysis, recovery factor estimation and project economics. Previous hands-on experience in using modern tools to perform typical engineering and economic analyses a plus. A geologist or geophysicist who has completed a petroleum engineering course should be able to perform this role. Will be expected to gather data from analog well and conduct their analyses through the 6-months and share examples of progress at regular meetings.
- **Petrophysicist** – well log interpretation, lithology, porosity and water saturation determination from log response. Previous hands-on experience in using modern tools to perform typical petrophysical analyses a plus. Will be expected to be working continuously and to be updating team mates on key findings that influence their activities in the project.
- **Rock Physicist** – generate rock physics models and establish relationships between P-impedance and rock/fluid properties. Previous hands-on experience in using modern tools to perform typical rock physics analyses a plus. Will be expected to be working continuously and be updating team mates on key findings that influence their activities in the project.

- **Faculty Advisor** – *recruited by the team* to provide regular guidance and support; preferably based at the team's university. Will be required to work closely with the SEG EVOLVE Project Manager. In most cases, the best person to fulfil this role will be a college professor, familiar with Petroleum Geology, Geophysics or Engineering that students have a prior relationship with.

The Faculty Advisor will be required to write a recommendation letter to accompany the SEG EVOLVE application. While it will not be required of the Faculty Advisor to attend any meetings, attendance at presentations and/or meetings is encouraged.

- **Team Leader** - Each Team will be asked to select one Team Leader that will be responsible for keeping up with other Team Members and liaising with the Professor and the SEG EVOLVE Team. This role will be in addition to the above technical responsibilities so will require additional effort but will also result in very broad learning. Teams will also be asked to name a backup Team Leader in the event of unavailability.
- **Advisor/Industry Coach** – *provided by the SEG* for each team to advise on tasks to be completed, suggest workflows, ask pertinent questions, and ensure that teams will meet deadlines.
- **Subject Matter Experts** – technical subject matter experts will be *identified by SEG* as resources for any team to call on for specific advice

Additionally, to cover SEG EVOLVE Carbon Solutions:

- **Operations Geoscientist:** subsurface integrity, geochemistry, CO₂ rock and materials interaction, connectivity, injection rates and pressure, stress, geopressures, well design, fractures, failures (such as induced seismicity), fluids and flow properties, fluid-dynamics, miscibility, geochemical interaction, well integrity, and geoscience measurements for monitoring (4D, InSAR, etc.)
- **Reservoir Modeler:** understand and prepare for static and dynamic modeling, storage values, volumes in place, fluids and flow properties, and property changes for storage, seismicity as part of monitoring plan. Previous hands-on experience in using modern tools to perform property distribution and fluid simulation is required.
- **Business Manager:** measuring, monitoring & validation (MMV) communication plan, support environment, governance & social (ESG), regulations and stakeholder communications.
- **Facilities Engineer:** land, logistics, surface, engineering, transportation, support pipelines, regulations, facilities, well construction, pressure gauges, metering and measurements.
- **Team Leader:** three positions are required for Carbon Solutions:
 - **Business:** Regulations, permitting, communication, stakeholders, ESG & reporting – Ultimate responsibility for investment recommendation delivery!
 - **Engineering:** Storage modeling/performance, facilities, wells, injection & economics; essential to bridging storage volumes, regulations and value.
 - **Subsurface:** Data, inputs to models/regulations, aquifers, seals, & reservoirs maps, risk, & MMV. Key role in cross-discipline integration.

Teams will receive special consideration if they consist of individuals covering all disciplines.

What is the time commitment for SEG EVOLVE?

SEG EVOLVE is an intensive program, so please do not underestimate the effort that will be required. We have found that dedication of least 10-30 hours a week as a team through the entire 6-month period are the most successful and benefit the most. Workload will change throughout the program based on the task at hand. Developing a GANTT chart with assigned responsibilities, is recommended for success.

The mentor resources and best practice of cross-team interaction, limits participation levels. With those consideration, being selected as a Team is recognition and a privilege. Selected Teams will be expected to take their SEG EVOLVE project to completion to receive the appropriate recognition and value.

On **rare occasions**, certain individuals have had to withdraw from SEG EVOLVE due to unforeseen circumstances and in those cases the Team Leader and Faculty Advisor are asked to find a replacement Team Member with an equivalent set of skills.

What is the program timeline?

| | Subsurface Characterization | Carbon Solutions |
|----------------------------|---------------------------------------|-------------------------------------|
| Pework | | Early-Mid August |
| Kick Off Meeting | January (1 st week) | August (4 th week) |
| Mid Project Presentation | March (2 nd week) | November (2 nd week) |
| Final Project Presentation | May (4 th week) | February (2 nd week) |
| Presentation Refinement | June-July | February-March |
| Conference | IMAGE – August (4 th week) | CCUS – April (3 rd week) |

What are the differences between SEG EVOLVE and the AAPG Imperial Barrel Award (IBA)?

SEG EVOLVE stresses multidisciplinary and collaborative learning. The program establishes real-life experience in a non-competitive learning environment for a period of 6 months. Lectures, mentoring, and support is provided along the way to help the teams succeed. Presentations are peer and expert reviewed to enable hands-on experience with technical and business skills including executive-level communication of the teams results..

IBA is a program defined as an 8-week competition for multidisciplinary teams with more limited mentoring.

How do you apply?

SEG will release the application in the SEG EVOLVE webpage, providing a link to the application system. **It will be an online application only.**

- Deadline for SEG EVOLVE Subsurface Characterization 2023: **15 November 2023, 11:59 PM USA Houston Time Zone.**
Teams announced early December.
- Deadline for SEG EVOLVE Carbon Solutions 2023: **15 May 2023, 11:59 PM USA Houston Time Zone.**
Teams announced early July.

Only one team member needs to fill out the application, with the support of your Faculty Advisor. You will be asked to list each team member during the application, but individual team members do not need to complete the application. SEG EVOLVE is a **multidisciplinary program** that should include the disciplines stated on the requirements so teams should strive to meet this goal.

Once the application is submitted, changes cannot be made to your application. For questions, please email evolve@seg.org.