Culturally Responsive
Artificial Intelligence
and Machine Learning

Arts & Entertainment:
Culture Creatives

Coding for the Culture:
Swift Coding and
App Development

Professional Development
for Social Mobility

The Art of Storytelling:
Screenwriting for
the Culture

Future-Proof
Entrepreneurship

Micro-credential Programs and Courses

Co-developed by industry experts, top HBCU faculty and notable workforce collaborators, PROPEL Learn is the signature virtual platform for HBCU students that provides comprehensive, experiential, innovative learning experiences and exposure to future-ready career opportunities. Through a series of culturally responsive, tech-focused, micro-credential programs, PROPEL Learn provides insight to a variety of industries including: Artificial Intelligence, Swift Coding, Arts & Entertainment, Cybersecurity, Clean Energy, Career Readiness & Leadership, and DEI.

Learning, Innovation, and Design Team

DR. CAMESHA WHITTAKER, is the Chief Learning & Innovation Officer at the PROPEL Center in Atlanta, Georgia. Under her leadership, the PROPEL Center launched its inaugural tech product, PROPEL Learn, with over 1,000 users in 2023. In addition, Dr. Whittaker leads PROPEL's virtual campus, overseeing product development, instructional design, curriculum development, research and development, faculty and consortia development.

With the support of founding partners Apple and Southern Company, the PROPEL Center serves as a dynamic epicenter of learning, equipping students with the requisite knowledge, skills, tools, and resources to revolutionize the global talent pipeline and workforce. Dr. Whittaker's passion for this work stems from extensive, broad-based collaborations in the marketplace, in public higher education institutions, as well as in Historically Black Colleges and Universities. Nationally, her work has been featured on several media platforms. Worthy of note is her C-SPAN presentation on civility with Representatives James Clyburn, Cathy Castor, Dr. Thelma Daley, and Dr. Allida Black; her PBS leadership discussion, Side by Side with Dr. Nido Qubein; and her contribution to The National Urban League's Interrupt Racism Summit.

Dr. Whittaker earned a Bachelor of Arts degree in Mass Communication from Bethune-Cookman University in Daytona Beach, FL, a Master of Arts degree in Public Communication from American University in Washington, DC, and a Ph.D. in Communication Studies, specializing in Organizational Communication, from Regent University in Virginia Beach, VA.

DR. CARL S. MOORE, a certified StrengthsFinder Coach, and MBTI administrator, is the president of Youniversal Luv Unlimited, a company devoted to empowering self-worth. Currently an Executive Fellow for Learning Innovation at PROPEL Education and President-Elect for the POD Network, he has served in leadership roles at Howard Community College, the University of the District of Columbia, and Temple University.

He is a faculty member at USC's Equity Institute, a board member for the Online Learning Consortium, and a peer evaluator for the Middle States Commission on Higher Education. Carl's expertise includes strategic planning, leadership development, inclusive teaching, and faculty development. His diverse background comprises creating faculty development units across various institutions and delivering courses and workshops in multiple formats. As an executive coach, Carl's mission is to facilitate individual, team, and organizational growth.

MARK ANTHONY WRIGHT, M.Ed., is the Director of Digital Learning and Instructional Design for the PROPEL Center. He was instrumental in launching PROPEL Learn, the virtual learning platform designed for upskilling all HBCU students to close the gap between industry and the Black talent pipeline. He is responsible for the design and management of the virtual platform, PROPEL Learn, as well as managing the product development side of the Learning, Innovation, and Design department.

Mark began his higher education academic pursuit at Johnson C. Smith University on a track and field scholarship, where he majored in Psychology. After two and a half years of college, he enlisted in the US Air Force, where he completed his Associate of Applied Science degree in Construction Technology from the Community College of the Air Force. Mark then completed his Bachelor of Science degree in Management from the University of Phoenix and received his post-bachelor Graduate Certificate Degree in Cognitive Science from the University of North Carolina Charlotte (UNCC). Mark graduated Summa Cum Laude in the Educational Technology Master's Degree program at North Carolina Central University (NCCU) with a concentration in Online Instructional Design.

As a former Curriculum and Training Manager for Linchpin Solutions, Inc., Mark led a team that included instructional designers, technical writers, and virtual reality (VR) software programmers for the redesign of the Federal Emergency Management Agency (FEMA) Logistics Training curriculum. As part of the redesign, Mark and his team successfully designed, developed, and integrated a virtual reality (VR) training simulation for the FEMA Logistics Systems (LSCMS) Manager and Specialist training course that is required to be taken by all FEMA LSCMS employees.

Mark also worked as a Curriculum Developer at the University of the District of Columbia Community College and was an Educational Technology Adjunct Professor for the University of the District of Columbia Van Ness main campus. As a testament to his love and commitment to teaching and learning, he is known in most spaces as, Professor Mark.

Faculty and Program Developers

DR. YAW AMPONSAH ADOO is a distinguished management professional with over a decade of experience in collegiate instruction, innovative social entrepreneurship, digital organizational leadership, and professional development. His research focuses on employee motivation, well-being, and the impact of organizational change, with expertise in areas such as job insecurity, work-related stressors, and workplace spirituality.

Currently serving as the Chair of the Department of Business at Morris Brown College, Dr. Adoo has held key roles at Shorter University and the University of the Virgin Islands. In August 2024, he joined the Harvard Business Review's Advisory Council, where he contributed valuable insights to shape management and leadership studies. His influence also extends to partnerships that foster curriculum development and cultural appreciation beyond academia.

DR. BRANDI BALDWIN: serves as the CEO of Millennial Ventures, an award-winning startup dedicated to launching impactful initiatives in the realms of education and workforce innovation. From empowering school districts with real-time student experience data for enhanced safety measures to guiding organizations in adopting sustainable diversity and inclusion practices, the Millennial Ventures team champions the notion that many challenges can be addressed not through dismantling existing systems but by designing new ones.

SUMMER JACKSON COLE is an award-winning broadcast journalist in News, Lifestyle, and Entertainment. She holds a Master of Arts in Mass Communication and Media Studies from Howard University and a Bachelor of Science in Broadcast Journalism from the University of Illinois in Champaign-Urbana. Summer is a scholar and practitioner. She is a Professor at Clark Atlanta University teaching Journalism, Media, and Communication Studies and is the Host of Atlanta Plugged In at Atlanta News First (CBS).

DR. KESHA MALLORY JAMES is the Director of Distance Education for Lawson State Community College and the LSCC Apple Tech Hub Program Manager. She led the LSCC Distance Education Program to rank #2 as one of the Best Online Community College Programs in 2019. With her vision, LSCC became 1 of 10 Apple Tech Centers for HBCUs, and she has over 12 years of experience as an instructor in the Business and Information Technologies Department. Dr. James holds a Doctor of Philosophy from Auburn University and is a graduate of Alabama State University. Dr. James is a certified Apple Teacher and Swift coding instructor.

DR. JOHNNY LOWERY, Assistant Professor of Management and Interim Department Chair at Claflin University, has over 40 years of military and corporate experience. He holds a Ph.D. in Business Administration from Jackson State University and advocates for diversity through the PhD Project, the Academy of Management, and the Southern Management Association. Additionally, he serves as a Faculty Liaison for the Business Executive Exchange Program (BEEP) and is a PROPEL Center's HBCU Faculty Fellow Academy (HFFA) member.

WILLIAM MAPP III, Morgan State University, Center for Equitable AI & Machine Learning Systems: William Lee Mapp, III is an author, maker, engineer, inventor, executive, nerd, and international speaker who has delivered talks stateside and in Europe and the Middle East. He's also a radio analyst and host known for his witty takes on the technology industry. His life's mission is to help people succeed by fostering compassion, communication, and collaboration using technology.

B.J. MURPHY is known in the industry as one of the Elite Morning Men of Urban Radio. Since graduating from Shaw University, B.J. has been on-air in small, medium, and major markets during his 40-year career. He is also the recipient of the Tom Joyner Personality of the Year award. The National Black Programmers Personality of the Year Award, and Billboard Magazines' #1 Up and Coming Urban Morning Show. B.J. Murphy will be officially placed in the National Black Radio Hall of Fame 2023 during an induction ceremony in Atlanta on Oct 7, 2023.

HALLEEMAH NASH is a social entrepreneur operating as the Founder of Rosecrans Ventures, an underrepresented talent solutions firm that provides coaching and career courses for marginalized talent populations in the workforce. Nash is a graduate of Howard University and a proud product of Compton, California.

DR. KOFI NYARKO, Morgan State University, Center for Equitable AI & Machine Learning Systems: Dr. Nyarko is the director of Morgan State University's Center for Equitable AI & Machine Learning Systems. He is also the director of Morgan's Data Engineering and Predictive Analytics research lab.

PROFESSOR RUTH OLUSEGUN specializes in AI and Blockchain technologies. Professor Olusegun is an Adjunct Professor at Bowie State University in the Department of Computer Science. She has taught Mathematics, AWS Cloud Computing, and Programming courses. She currently teaches Swift Programming & Mobile App development and Computer Literacy Applications.

NINA PACKER is an innovative nonprofit, education, and entertainment professional with a strong track record of developing charitable partnerships to create career exposure and pipeline programs in media and entertainment. She developed the pre-college program known today as Warner Bros. Discovery: Future Leaders Institute and was instrumental in creating music industry degree and certificate programs at Jackson State University and Florida A&M University, where she served as an adjunct professor of a music management practicum course for twelve years. Nina has produced content highlighting HBCUs for YouTube Originals, Blackstream Live, and NBCUniversal.

SYLVESTER POLK is a faculty member who serves as Professor of Practice for Music Technology at Bethune-Cookman University. He is also the Co-Owner of Polkbros Productions and has over 40 years of experience in the entertainment industry working as a professional musician, studio engineer, FOH engineer, producer, audio technician, performer, arranger, composer, songwriter, programmer, midi sequencer, audio and editor, and vocalist. Professor. Polk holds a Master of Music in Music Education from the University of Central Florida and a Bachelor of Science in Music Education from Florida A&M University.

DR. YASMEEN RAWAJFIH is an Assistant Professor in the Computer Science (CS) Department at Tuskegee University. She received her Ph.D. in Computer Science and Software Engineering from Auburn University. Dr. Rawajfih teaches many core courses in the CS curriculum at Tuskegee University including Software Engineering, Design and Analysis of Algorithms, Statistics, and Data Analytics.
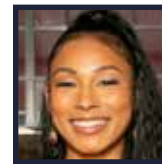
TYTIANNA RINGSTAFF, Ph.D. is the director of Simmons College of Kentucky's Digital Teaching and Learning Center and the Artistic Director and Curriculum Designer of the Black Film Institute. She is also a Board member of the American Civil Liberties Union of Kentucky (ACLU) and CEO/Founder of Honey Tree Publishing.

DR. RUTH ANNETTE SMITH is a distinguished and internationally certified hospitality educator, entrepreneur, industry professional, and transformational leader dedicated to advancing innovative curriculum design, cutting-edge technology integration, and forward-thinking pedagogy. She is the Department Chair and Associate Professor of Hospitality Management at Bethune-Cookman University in Daytona Beach, Florida, founder and owner of Creatively Yourz LLC, a hospitality consulting company, and the Director of Education for the International Council on Hotel Restaurant & Institutional Education (ICHRIE).

Dr. Smith previously served as Vice President, President, and Director of Education for the Southeast, Central & South American (SECSA) Federation of ICHRIE and is recognized as one of the thirty Most Influential Educators in the USA and one of USA's Top 100 Most Powerful Hospitality Educators. She proudly embraces her roles as a PROPEL HBCU Faculty Fellow and a UNCF Faculty Fellow, affirming her dedication to shaping the future of the next generation of leaders and game- changers.

Dr. Smith brings real-world expertise to the classroom, ensuring that students are equipped with the skills and knowledge necessary to thrive in a rapidly evolving global marketplace. A passionate advocate for student success, she has a proven track record of fostering an inclusive learning environment that empowers students to excel academically and professionally. As a thought leader in hospitality education, Dr. Smith continually bridges the gap between academia and industry, driving impactful change across the sectors.

STEVEN STARKS is the CEO and founder of Starks Films, LLC, a global film company that focuses on telling unique stories through captivating visuals and high-quality cinematography. Steven has a diverse portfolio, having worked on feature films such as The Hunger Games and the Own Network's "Green Leaf." Steven is also a Mass Media Arts Professor at Clark Atlanta University, teaching in the Mass Media Department. As a graduate of Shaw University, he frequently visits his alma mater to mentor Mass Communication students and encourage them to pursue their dreams.

DARNELL LAMONT WALKER is an Emmy-Nominated children's television writer who understands the power of representation, creating content in hopes that all children get the opportunity to not only see themselves, but see how incredible they are and can be. Following his big break in the Sesame Street Writer's Room Fellowship, Darnell has written for a multitude of outstanding shows, including PBS Kids' Work It Out Wombats!, Netflix's Karma's World, and Nickelodeon's Blue's Clues & You.

Currently living between the Chattahoochee National Forest of Georgia and Johannesburg, South Africa, Darnell, a Charlottesville, Virginia native, also produces social justice documentaries, using them as bridges to help others get from where they are to healing and joy. Seeking Asylum, Darnell's first film, explores safe spaces around the world for Black Americans seeking to escape American injustice. His second film, Outside the House, explores Black mental health and healing. Lastly, Set Yourself on Fire provided a safe space where global survivors of sexual assault shared their journeys and struggles toward healing and happiness. Darnell's goal with his art is to continue to support children, adults, and whole communities around the world through the building of safe and happy spaces.

GABRIELLA WATERS, Morgan State University, Center for Equitable AI & Machine Learning Systems: Gabriella is a AI/ML and cognitive science researcher at Morgan State University's Center for Equitable AI & Machine Learning Systems (CEAMLS). She is also a member of the Center's leadership team working to fulfill CEAMLS's mission.

AVERY O. WILLIAMS, Award-winning screenwriter-director. MFA grad from NYU, Tisch . Co-directed features Misguided Behavior wi/ Carl Payne and Skinned w/Lisa Raye McCoy. Directed pilot for Intersection, an Emmy-nominated digital series. Currently an Assistant Professor in the Cinema, Television, and Emerging Media Studies program at Morehouse College in Atlanta, GA.

Coding for the Culture: Swift Coding and App Development

- **Socially Just Coding — Develop in Swift Explorations: Part 1**

- **Socially Just Coding — Develop in Swift Explorations: Part 2**

- **Socially Just Coding — Building Apps for Social Mobility: Part 1**

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Coding for the Culture: Swift Coding and App Development

Do you want to embark on a coding journey without any prior experience? Are you eager to learn Swift programming and open doors to new opportunities? Our four-course Swift programming micro-credential series is designed for learners of all backgrounds, including neuro- and socially-diverse individuals. Each course builds upon the last, providing a strong foundation for your coding journey. Upon completion, you'll be ready to tackle the App Development with Swift Certification level one exam. **Don't wait – start your coding adventure with us today and transform your future!**

Through our Coding for the Culture program, you'll dive into coding with Swift, learning core programming concepts through hands-on activities and creating a socially conscious PhotoFrame prototype app. You'll deepen your skills by developing a QuestionBot prototype app, while exploring the impact of your actions as an app developer on society. Focus on collaboration as you work with peers to build components of an app promoting social mobility, applying your socially-just coding lens for meaningful change. Finally, you'll independently create an app for social mobility, utilizing your accumulated knowledge and skills. Upon completion, you'll be well-prepared for the App Development with Swift Certification level one exam.

HIGHLIGHTS

➤ **Live weekly office hours** with course facilitators and student success coaches

➤ **Insights** from renowned course facilitators and student success coaches

➤ Generalized **knowledge** of Swift Coding and app development

➤ Topic-related **activities and assignments** reinforce understanding of concepts

➤ **Exposure to Apple** technology, applications, and productivity tools

➤ **Information** connected to existing knowledge and real-world tasks

➤ Personalized **feedback, support, and network development**

WHO IS THE PROGRAM FOR?

Beginner Developers: Those who are new to coding who want to gain a technical understanding of fundamental concepts. Prior computer science experience is not required to learn about and engage with Apple Swift coding programming language. Using culturally relevant examples and real world applications, participants will discover how to use Swift Coding to build applications suited for their interests.

Intermediate Developers: Those with some familiarity with coding will extend their understanding and develop additional skills to develop culturally relevant, solution-oriented approaches to building applications. Apple Swift Coding will be explored and applied to diverse scenarios based on participants' unique interests using industry standard tools and techniques.

Advanced Developers: Those who arrive with more in-depth knowledge, or obtain it through previous modules, will expand their knowledge, increase their programming skills, and create culturally relevant, practical applications based on their individual interests. Learn skills that will help to create the foundation for your career aspirations through customized app development.

WHAT WILL YOU LEARN?
Through a learner-centered design each course in the series will provide learners with the opportunity to:

➢ Engage with learners and course facilitators to deepen one's understanding;

➢ Build and play in Xcode playgrounds;

➢ Design through guided app projects; and

➢ Reflect on one's experience through reactions, feedback, and comments.

OBJECTIVES
Learners completing courses in the micro-credential program are expected to:

➢ Complete the learning activities in the given timeframe.

➢ Dedicate the time necessary to complete learning activities and assignments in each module.

➢ Engage with material, other learners, and course facilitator(s).

OVERVIEW
PLEASE NOTE: This course requires a minimum of 2-4 hours per week of engagement with course learning activities, resulting in a maximum of 32 hours to successfully earn your course badge. **It is recommended not to take this course with any other PROPEL course.**

COURSE 1: Socially Just Coding:
Develop in Swift Explorations: Part 1
The first course in a series of four designed to prepare learners to code and develop applications using the Swift programming language, with no previous experience required. In this course, you will learn core programming concepts through hands-on activities, Xcode playgrounds, and app projects through a socially just lens. You will apply your app development skill through building a PhotoFrame prototype app using programming in Xcode. Lastly, you will explore the impact of computing innovations and the decisions you make about your actions online and as an app developer for the benefit of society.

COURSE 1: Socially Just Coding:
Develop in Swift Explorations: Part 2
Socially Just Coding Pt. 2 is the second course in the four-course series. In this course, you will continue to learn core programming concepts through hands-on activities, Xcode playgrounds, and app projects. You will dig deeper into building your app development skills, through the development of a QuestionBot prototype app using programming in Xcode. Lastly, you will explore how you can personally leverage computing innovations and society through the decisions you make about your actions online and as an app developer.

COURSE 3: Building Apps for Social Mobility: Part 1
Building Apps for Social Mobility Pt. 1 is the third course in the four-course series. In this course, you will collaborate with classmates to practice building components of an app that provides greater social mobility for those in society. You will engage in deep reflection and exploration of how your socially-just coding lens can be applied to building something that changes the world for the better. This course will put all your app development skills, knowledge of app design, and programming in Xcode skills to use as you work with a group of peers to review and discuss apps that make a difference in society.

COURSE 4: Building Apps for Social Mobility: Part 2
Building Apps for Social Mobility Pt. 2 is the final course in the four-course series. In this course, you will independently build an app that provides greater social mobility for those in society. You will engage in deep reflection and exploration of how your socially just coding lens can be applied to building something that changes the world for the better. In this course, you will use your app development skills, knowledge of app design, and programming in Xcode to create your very own application, bringing all that you've learned and accomplished throughout the series to a culmination. Upon completion of the micro-credential, you will have the skills to complete the App Development with Swift Certification level one exam.

LEARNING ACTIVITIES

Small assignments and check-ins throughout the first course will ensure that learners have mastered the foundational concepts and are ready for the next step.

The first two courses focus on the foundations of coding and its implications for social justice. The second two courses are centered around the fundamentals of app development and social mobility.

Learning Enrichments

➢ Personal reflection

➢ Practice activities

➢ Hands-on projects

Learning Methods

➢ Challenge-based learning activities

➢ Industry experts and credentialed guest speakers provide a rich learning environment.

➢ Instructional methods that support diverse learners

➢ Activities and assessments that tap into learners' prior knowledge and experience and encourage active learning

➢ Authentic assessments that include challenge-based learning, scenarios, and hands-on practice activities

➢ Encouraging learner motivation through use-cases, projects, and challenge-based learning

➢ Scaffolding and chunking of information to support the learning of all students

➢ Transparency of course expectations and competencies promoted so learners know what they will be learning and exactly what to do to learn the content

➢ Encouraging social learning through a learning community

➢ Continuous engagement and feedback

➢ Ease of access to learning materials through the use of a mobile first learning platform

WHAT IS A MICRO-CREDENTIAL?

A micro-credential is a certification that recognizes an individual's proficiency in a specific skill or set of skills. Unlike traditional degrees, micro-credentials are often shorter, more focused, and designed to be completed in a relatively short time. They are intended to be stackable, meaning learners can earn multiple micro-credentials over time, building their skills and knowledge progressively. Micro-credentials are particularly valuable in today's fast-changing job market because they allow individuals to quickly acquire and demonstrate competencies that are immediately relevant to their careers.

What is a Micro-Credential Certification at PROPEL?

To earn a Microcredential Certification at PROPEL, a learner must complete a minimum of any three to four courses in a career track, based on prior experience, knowledge, and expertise. Upon completion of these courses, a learner will receive a Microcredential Certification and Badge that denotes completion of all three levels of the courses (Levels I, II, and III).

FACILITATORS

➢ **Industry Experts:** Specialist in Swift coding and app development.

➢ **Certified Computer Engineers and Subject Matter Experts:** Professionals with experience in app design and development.

➢ **Guest Speakers and Mentors:** Influential industry leaders from tech companies.

SYSTEM REQUIREMENTS

➢ **Mac Computer:** This course uses the Xcode 15 edition of Develop in Swift Explorations, Fundamentals, and Data Collections - which requires at least macOS Mojave on a Macbook. You are welcome to complete the course using the latest version of Xcode, Xcode 12, which requires macOS Catalina. Either version works with our curriculum. Courses are updated to the latest Xcode and textbook edition on a cyclical basis as part of continuous improvement. However, the Xcode 10 update ensured that future updates do not impact existing code within the scope of our courses. Minor differences between versions are covered at the beginning of the course.

➢ *Develop in Swift Explorations* Textbook

➢ Apple Design Workbook

SOCIALLY JUST CODING —
Develop in Swift Explorations: Part 1

Socially Just Coding is part 1 of a two part series in Develop in Swift Explorations. This eight-week course introduces students to core programming concepts through hands-on activities, Xcode playgrounds, and app projects. You'll build your app development skills as you go, learning about app design as well as programming in Xcode. You'll also have opportunities to think about the impact of computing innovations, and the decisions you make about your actions online and as an app developer. Between units, you'll explore a story about a group of students in a TV club. As you follow these episodes, you'll have a chance to think about different aspects of online engagement, how information is shared online, and what kinds of decisions need to be made in a connected world.

This course teaches the foundations of coding and leverages Coding with Swift, Apple's, seamless, straightforward program language providing learners with an engaging way to learn the coding language of the future while embarking on the journey of self discovery. In this course, students are not only given an opportunity to learn, but learn something that can change your life and the world. Students learn key computing concepts, building a solid foundation in programming with Swift. They'll learn about how to directly address social problems

while being taught the methods of coding and app development. Further, students will learn the impact of computing and apps on themselves, society, economies, and cultures while exploring iOS app development. **Upon completion of this course, you will earn a badge in Swift Explorations Pt. 1**

HIGHLIGHTS

➤ **Live weekly office hours** with course facilitators and student success coaches

➤ **Insights** from renowned course facilitators and student success coaches

➤ Generalized **knowledge** of Swift Coding and app development

➤ Topic-related **activities and assignments** reinforce understanding of concepts

➤ **Exposure to Apple** technology, applications, and productivity tools

➤ **Information** connected to existing knowledge and real-world tasks

➤ Personalized **feedback, support, and network development**

OBJECTIVES

By the end of this course, you will have built several simple apps and prototyped an app of your own design. Along the way, you'll have gotten a taste for the world of app development—gaining an appreciation for how technology works, how you can use it to express yourself, and how it can be used to solve problems. In this course we will specifically:

➢ Explore the impact of coding on social justice

➢ Learning technology, theory, and Swift coding language

➢ Understand how to use Swift coding language

➢ Practice designing and building applications

OVERVIEW

PLEASE NOTE: This course requires a minimum of 2-4 hours per week of engagement with course learning activities, resulting in a maximum of 32 hours to successfully earn your course badge. **It is recommended not to take this course with any other PROPEL course.**

MODULE 1: Coding in Society

In this 1 week module, we will begin by examining personal identity and how coding can be used to promote diversity and inclusion. We will discuss how coding can be used as a tool to create solutions for social issues, and how these solutions can have a significant impact on society. We'll also talk about the many career paths available to those with coding skills. From software development to user experience design, the opportunities are endless. Lastly, we will discuss how proficiency in coding can enhance employability and provide opportunities for advancement.

MODULE 2: Programming Fundamentals

In this 2 week module, you will learn Programming Fundamentals. Programming is the process of giving a computer instructions to execute. It involves providing inputs to a computer, which are then processed and manipulated, and finally, outputs are generated. Programming is all about inputs and outputs, and it's a critical skill that has become increasingly important in our digital age.

MODULE 3: Build and Design with Swift

In this 1 week module, you will learn how to use coding to build and design applications using the Swift programming language. You will experiment with programming ideas without building an entire app and learn how to write code, watch it run, change it, and watch it run again. Lastly, you will explore these concepts in Xcode playgrounds, build a word game in a playground, and get started with Interface Builder to build and run your own app that displays a photo.

MODULE 4: Algorithms

In this 2 week module, you will learn about algorithms, which are a set of instructions for accomplishing a task. Building off of the work you've completed in previous modules, you will learn to articulate algorithms to solve problems and use pseudocode to plan the steps of an algorithm before writing and debugging actual code. You will explore sequencing and selection, where the order of instructions is crucial, and choices determine the sequence's flow. Lastly, you will learn to examine conditions at the time your code runs, and your program will proceed along one of many possible paths.

MODULE 5: Build and Design with Playground Basics

In this 2 week module, you will use your knowledge of Playground Basic to build a QuestionBot App. You will be part of a team that's building a chat app called QuestionBot. In doing so, you will only focus on one part of the app, which is to work on QuestionBot's "brain," the part that decides how to answer questions. Ultimately, you will build knowledge for the bot, a personality to go with it, and give the app a unique behavior of your own design! Other parts of the app, such as the design, user interface, and the parts that take the question and display the answer, have already been completed.

LEARNING ACTIVITIES

Get Started: You'll begin by learning the key concepts covered in the unit, exploring how they relate to your everyday experiences, and completing activities that deepen your understanding. By using coding concepts to think about everyday problems, you'll also be learning to think critically, to see the world as a programmer, and to apply computational reasoning.

Play: In this section, you'll apply the key concepts in Xcode playgrounds, where you can experiment with code and see the results immediately. As you complete each activity, you can check your understanding by answering review questions in the book.

You'll also apply your understanding of the unit concepts through fun, creative playground challenges that will help you start thinking about your own app projects. Later in the book, you'll build simple apps to explore development topics.

Build: You'll be guided through the steps of building an app in Xcode. For this section, you'll want to keep the book open while you're working in Xcode"

Design: You'll explore the impact of computing innovations and experience the app design process. You'll also consider the choices that app designers and developers make, knowing that their app could impact thousands— even millions —of people.

Using the Develop in Swift App Design Workbook, you'll get creative. This is your chance to apply your design thinking, develop a great idea, create an interface, and prototype and test your concept. You'll learn how to consider different perspectives, and how to use feedback from mentors, friends, and diverse users to improve your app.

Much of the applied learning in this course takes place in an Xcode playground. Playgrounds allow you to write Swift code and immediately see the results in a live preview. Playing with code and seeing what it does is a great way to get started coding and to experiment with new ideas.

LEARNING METHODS

- Challenge-based learning activities
- Industry experts and credentialed guest speakers provide a rich learning environment.
- Instructional methods that support diverse learners
- Activities and assessments that tap into learners' prior knowledge and experience and encourage active learning
- Authentic assessments that include challenge-based learning, scenarios, and hands-on practice activities
- Encouraging learner motivation through selected use cases and project based learning
- Scaffolding and chunking of information to support learning of all students
- Transparency of course expectations and competencies promoted so learners know what they will be learning and exactly what to do to grasp the concepts.
- Encouraging social learning through a learning community

REQUIREMENTS

Software

- Visit Apple App Store and download Xcode 15, which requires latest OS Macbook

Textbook and Needed Resources

- Development in Swift Explorations, Fundamentals, and Data Collections.
- Apple Design Workbook

FACULTY

**Dr. Kesha
Mallory James**

**Dr. Yasmeen
Rawajfih**

**Carl S.
Moore, Ph.D.**

**Professor
Ruth Olusegun**

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SOCIALLY JUST CODING —
Develop in Swift Explorations: Part 2

Socially Just Coding Pt. 2 is the second course in the four-course series. In this course, you will continue to learn core programming concepts through hands-on activities, Xcode playgrounds, and app projects. You will dig deeper into building your app development skills, through the development of a QuestionBot prototype app using programming in Xcode. Lastly, you will explore how you can personally leverage computing innovations and society through the decisions you make about your actions online and as an app developer.

In this course, students delve into essential computing concepts and establish a strong foundation in Swift programming. They will explore the profound influence of computing and applications on societal structures, economic trends, and cultural dynamics, all within the realm of iOS app development. Guided lessons walk students through the intricate stages of app design, from ideation and strategizing to prototyping and assessment. Even as they hone the skills to transition prototypes into fully-fledged applications, the emphasis on design fosters a deeper understanding of coding and underscores its significance.

HIGHLIGHTS

➤ **Live weekly office hours** with course facilitators and student success coaches

➤ **Insights** from renowned course facilitators and student success coaches

➤ Generalized **knowledge** of Swift Coding and app development

➤ Topic-related **activities and assignments** reinforce understanding of concepts

➤ **Exposure to Apple** technology, applications, and productivity tools

➤ **Information** connected to existing knowledge and real-world tasks

➤ Personalized **feedback, support, and network development**

OBJECTIVES

➤ Demonstrate the ability to create custom types using structs.

➤ Construct arrays containing a specified number of items and apply loop techniques to process them.

➤ Identify and implement enums to represent specific sets of related values.

➤ Produce pixel art, extend a data visualizer tool, and design an algorithm that can categorize password strength levels (e.g., weak, medium, strong).

➢ Develop and present an interactive game app with at least three different colorful shapes.

➢ Evaluate and report on at least two computing innovations that have led to unintended consequences, detailing both positive and negative outcomes.

➢ Draft clear specifications for an app idea and construct an interactive prototype using Keynote, ready for user testing.

➢ Complete at least two guided projects in Xcode and Interface Builder, each resulting in a functional app.

➢ Implement user interface elements on a screen, establish coded connections for these elements, and demonstrate handling of at least three different user interaction events.

➢ Showcase the progression of an app's development through at least three different stages, with evidence of testing at each phase.

OVERVIEW

PLEASE NOTE: This course requires a minimum of 2-4 hours per week of engagement with course learning activities, resulting in a maximum of 32 hours to successfully earn your course badge. **It is recommended not to take this course with any other PROPEL course.**

MODULE 1: Instances, Methods and Properties
Build on your knowledge of types by learning about the methods and properties that make up an instance of that type. You learn the difference between a type and an instance, and learn how to use the Xcode documentation viewer to find information about unfamiliar types, properties, or methods.

Learning outcomes
➢ Create values without using literals.

➢ Describe the difference between a type and an instance.

➢ Describe the difference between a method and a property.

➢ Use documentation to find out information about unfamiliar types"

MODULE 2: Arrays and Loops
Learn how arrays provide a common way to group objects in an ordered list. You will learn how to create and work with arrays by adding and removing objects. Also, you learn how to use a for... in loop to work with each object in an array.

Learning outcomes
➢ Develop data abstraction using arrays to store multiple elements.

➢ Explain how the use of data abstraction manages complexity in program code.Understand and explain common use cases for arrays.

➢ Use arrays to manage collections of objects.

➢ Iterate through an array to perform a common action on each item in the collection.

MODULE 3: Structures
In Module 3 You will recognize that it is often useful to group related information and functionality into a custom type and learn how to define a custom type by using a structure with accompanying properties and methods. In practice, you will be creating a custom Song type that has related properties to define the title, artist, and duration of each instance.

Learning outcomes
➢ Understand and explain the importance of custom structures and their common use cases.

➢ Design a custom structure to group related data into one type.

➢ Define custom properties and methods for custom structures.

MODULE 4: Enums and Switch
Enumerations, or enums, are a way to define a named list of options. You will learn what enums are used for, how to define them, and common ways to work with them. Also, you will learn to use the switch statement to conditionally run blocks of code based on the value of an enum instance.

Learning outcomes
➢ Understand and explain the benefits and proper use cases of enumerations, or enums.

➢ Use a switch statement on an enum value to conditionally trigger specific code."

MODULE 5: Testing Code
Due to the nature of computer technology, many kinds of basic values have limits. Students will discover the limits of two types— Int (and its various flavors) and Double. They'll learn how to evaluate the way functions might fail, and think about the inputs and outputs of functions.

Learning outcomes
➢ How built-in types are not perfect representations of the data they represent.

➢ Why documentation and testing are important.

➢ How to test a function.

MODULE 6: Processing Data

Process a large data set from a hypothetical survey. Data transformation and data translation are the two key techniques used in this lesson. Regardless of the presence of errors (or lack thereof), both are common techniques when working with large amounts of data.

You will also encounter third-party code and use it to solve a problem. Using code that's not your own is an almost universal practice—it's hard to find a program that's completely self-reliant. The key to using third-party code is to verify that it's safe and sound, and to abide by any license terms that accompany it.

Learning outcomes

➢ Tally basic information in a large data set.

➢ Identify and correct simple errors using a variety of data transformation techniques.

➢ Use and cite third-party code.

➢ Translate data to derive statistical information.

MODULE 7: Bouncy Ball App

Build a physics-based game that uses touch interactions—a much more complex app than those in previous lessons. You build the app in stages, stopping along the way to verify that their code works. Also, you will refactor your code multiple times, reorganizing it to make it more flexible or to enable new functionality without changing how it works.

Learning outcomes

➢ Follow the incremental development process to build an app in small stages, testing their code after each step.

➢ Explain the benefits of incremental development.

➢ Refactor their code to keep it readable and organized.

➢ Describe how callbacks enable code to be triggered by events.

➢ Use functions as callbacks.

MODULE 8: Experiment with Building Apps Part 1

Complete a Rock/Paper/Scissors game from scratch. You will review a variety of concepts covered in Units 1-4, and build the user interface, the model data, and the controller objects that make up the entire application.

Learning outcomes

➢ Apply the Model-View-Controller (MVC) design pattern.

➢ Use an enum to model simple app state.

➢ Show and hide user interface elements as the app's state changes.

➢ Randomize game play.

MODULE 9: Experiment with Building Apps Part 2

You made it! This is your final project. You will complete an app for studying and quizzing with the periodic table of elements and apply the skills you've acquired throughout the course, using the incremental development process as they build the app from a simple interface into a full-featured app with two modes. Also, you learn about how to handle keyboard input and use the standard iOS alert dialog to present the user's score.

Learning outcomes

➢ Follow the incremental development process over the course of a complex app.

➢ Refactor their code multiple times as they add features.

➢ Track app state with multiple properties.

➢ Use the single-path UI update pattern to modify the user interface as the app's state changes.

➢ Handle keyboard input with a text field.

➢ Display an alert and handle its completion callback.

FACILITATORS

➢ **Industry Experts:** Specialist in Swift coding and app development.

➢ **Certified Computer Engineers and Subject Matter Experts:** Professionals with experience in app design and development.

➢ **Guest Speakers and Mentors:** Influential industry leaders from tech companies.

FACULTY

Dr. Kesha Mallory James

Dr. Yasmeen Rawajfih

REQUIREMENTS: THIS COURSE USES THE XCODE 15 EDITION OF "DEVELOP IN SWIFT EXPLORATIONS, FUNDAMENTALS, AND DATA COLLECTIONS", WHICH REQUIRES AT LEAST MACOS MOJAVE AND A MACBOOK.

SOCIALLY JUST CODING —
Building Apps for Social Mobility: Part 1

HIGHLIGHTS

Socially Just Coding: Building Apps for Social Mobility Pt. 1 is the third course in the four-course series. In this course, you will be introduced to iOS development tools, while continuing to develop your basic programming skills and learn industry best practices. Building on this foundation, you will work through practical exercises, create apps from scratch, and build the mindset of an app developer. Throughout this course, you will have the chance to design, prototype, and test an app of your own! You will connect and apply the coding skills you have been learning thus far to bring your app idea to life.

- ➢ **Gain a solid understanding** of the Swift programming language, mastering concepts like data types, functions, and control flow, essential for iOS app development.

- ➢ **Acquire a comprehensive skill set** in iOS app development, including UI design with Interface Builder, navigation controllers, debugging techniques, and more, setting a strong foundation for future projects.

- ➢ **Build practical iOS apps** from scratch, leveraging UIKit and Xcode, and apply your coding skills to create real-world apps.

- ➢ **Enhance your problem-solving abilities** by working through guided projects, debugging code, and tackling challenges commonly encountered in app development.

- ➢ **Prepare for a career in iOS app development** or pursue personal projects, equipped with the knowledge, skills, and hands-on experience necessary to succeed in the rapidly evolving field of mobile app development.

OBJECTIVES

- ➢ Build fundamental iOS app development skills with Swift
- ➢ Master the core concepts and practices that Swift programmers use daily
- ➢ Build a basic fluency in Xcode source and UI editors
- ➢ Create iOS apps that adhere to standard practices, including the use of stock UI elements, layout techniques, and common navigation interfaces

WHO IS THE COURSE FOR?

Beginner Developers: Those who are new to coding who want to gain a technical understanding of fundamental concepts. Prior computer science experience is not required to learn about and engage with Apple Swift coding programming language. Using culturally relevant examples and real-world applications, participants will discover how to use Swift Coding to build applications suited to their interests.

Intermediate Developers: Those with some familiarity with coding will extend their understanding and develop additional skills to develop culturally relevant, solution-oriented approaches to building applications. Apple Swift Coding will be explored and applied to diverse scenarios based on participants' unique interests using industry-standard tools and techniques.

Advanced Developers: Those who arrive with more in-depth knowledge, or obtain it through previous modules, will expand their knowledge, increase their programming skills, and create culturally relevant, practical applications based on their individual interests. Learn skills that will help to create the foundation for your career aspirations through customized app development.

OVERVIEW

PLEASE NOTE: This course requires a minimum of 2-4 hours per week of engagement with course learning activities, resulting in a maximum of 32 hours to successfully earn your course badge. **It is recommended not to take this course with any other PROPEL course.**

In this eight-week course, participants will continue their app development with Swift journey by focusing on more advanced Swift concepts and guided projects. Students will develop a deeper understanding of app development concepts and gain the practical skills needed to create impactful iOS applications. Learning experiences are delivered through 6 dynamic modules designed to foster creativity and problem-solving abilities, empowering students to pursue their aspirations in the dynamic field of iOS app development.

MODULE 1: Review of Swift and Playgrounds Basics

In this module, you'll revisit essential concepts to strengthen your Swift programming skills and better prepare you for the remainder of this course! You'll learn to identify app challenges and compare your idea to competitor solutions to better understand your audience's needs. Additionally, you'll review the usage of Xcode playgrounds to execute Swift code effectively. Furthermore, you'll refresh your understanding of defining constants and variables, as well as exploring the various Swift types to enhance your coding proficiency.

MODULE 2: Operators and Control Flow

In this module, you'll explore some fundamental Swift programming concepts and building blocks. You'll learn how to perform basic mathematical operations, understand operator precedence, and apply numeric type conversion effectively. Additionally, you'll master control flow mechanisms like if and else statements, switch statements, as well as logical and comparison operators to manage the execution of code based on different conditions.

MODULE 3: Building, Running, and Debugging Apps in Xcode

This module is designed to equip learners with essential skills for app development using Xcode. You'll learn to navigate Xcode projects efficiently, and utilize key features like the Project navigator, debug area, assistant editor, and version editor. Additionally, you'll master running apps on both the Xcode simulator and physical devices, performing basic debugging with breakpoints, accessing Xcode's documentation browser, and leveraging Interface Builder to create and preview user interfaces seamlessly.

MODULE 4: Guided Project: Light

In this module, you will apply your accumulated knowledge from previous modules to create a practical Swift app: the Light app. This app utilizes an iPhone's screen as a flashlight, providing a hands-on opportunity to implement fundamental programming concepts in a real-world scenario. Throughout the project, you will also master the use of Xcode's documentation, debugging features, outlets, and actions, further enhancing your proficiency in app development.

MODULE 5: Diving Deeper into Swift Programming Language

In this module, you'll embark on an immersive journey into the core concepts and advanced techniques of Swift app development and design. From building app prototypes to mastering essential data types and control structures, this module will equip you with the skills needed to develop robust and dynamic iOS applications. You'll explore topics such as string manipulation, function declaration, custom structures and classes, inheritance, and collection manipulation, empowering you to create sophisticated and feature-rich apps with confidence and precision.

MODULE 6: Building Apps with UIKit

In this module, you'll dive into the foundational framework of UIKit, an essential part of iOS app development. You'll explore the importance of UIKit and its role in creating engaging user interfaces. Throughout the module, you'll familiarize yourself with common views and controls used in apps, such as labels, image views, text views, buttons, and sliders. Using Interface Builder, you'll learn how to configure and customize these views to create dynamic and visually appealing user interfaces for your apps. By the end of the module, you'll have the skills to create and customize various UI elements, setting the stage for building immersive and user-friendly iOS applications.

LEARNING ACTIVITIES

Learning Enrichments

- Interactive lectures where key concepts of iOS app development and the Swift programming language are introduced and discussed.
- Guided projects that allow hands-on application of concepts learned, building real-world iOS apps.
- Lab exercises using Xcode playgrounds to reinforce learning and practice coding skills independently.
- Working through the App Design Workbook to develop and refine app ideas, focusing on user-centered design principles.
- Prototype Development using tools like Keynote to visualize app ideas and iterate on design concepts.

Learning Engagement

- Learners engage in both individual and group activities that foster intrapersonal and interpersonal awareness, which is vital for working with diverse teams.
- Regular mentorship sessions provide insights into applying course concepts in real-world situations.
- Capstone projects encourage the practical application of skills and showcase the ability to integrate knowledge effectively.

Learning Methods

- Challenge-based learning activities
- Industry experts and credentialed guest speakers provide a rich learning environment.
- Instructional methods that support diverse learners
- Activities and assessments that tap into learners' prior knowledge and experience and encourage active learning
- Authentic assessments that include challenge-based learning, scenarios, and hands-on practice activities
- Encouraging learner motivation through use cases, projects, and challenge-based learning
- Scaffolding and chunking of information to support the learning of all students
- Transparency of course expectations and competencies is promoted so learners know what they will be learning and exactly what to do to learn the content
- Encouraging social learning through a learning community
- Continuous engagement and feedback
- Ease of access to learning materials through the use of a mobile-first learning platform

FACILITATORS

- **Industry Experts:** Specialist in Swift coding and app development.
- **Certified Computer Engineers and Subject Matter Experts:** Professionals with experience in app design and development.
- **Guest Speakers and Mentors:** Influential industry leaders from tech companies.

REQUIREMENTS AND MATERIALS

- **Mac Computer:** This course uses the Xcode 15 edition of Develop in Swift Fundamentals
- **Collections, which requires at least macOS Mojave on a Macbook.** You are welcome to complete the course using the latest version of Xcode, Xcode 12, which requires macOS Catalina. Either version works with our curriculum. Courses are updated to the latest Xcode and textbook editions on a cyclical basis as part of continuous improvement. However, the Xcode 10 update ensured that future updates do not impact existing code within the scope of our courses. Minor differences between versions are covered at the beginning of the course.
- *Develop in Swift Fundamentals* Textbook
- Apple Design Workbook

Upon completion, you will have a solid foundation in fundamental iOS app development skills with Swift and mastery of the core concepts and practices that Swift programmers use daily. You will also build a basic fluency in Xcode source and UI editors and create iOS apps that adhere to standard practices, including using stock UI elements, layout techniques, and common navigation interfaces.

FACULTY

Dr. Yasmeen Rawajfih