Colorado Outdoor Recreational Leadership Course Scope and Sequence

Course Name	**Bike Tech I**	**Course Details**	Level 1 course in the Outdoor Recreational Leadership Pathway. This course fits within the Bike tech/Mountain Bike strand.
		Course = 0.50 Carnegie Unit Credit	
Course Description			
Note:	This is a suggested scope and sequence for the course content. The content will work with any textbook or instructional resource. If locally adapted, make sure all essential knowledge and skills are covered.		
SCED Identification #		Schedule calculation based on 60% of a semester instructional time. Scope and sequence allows for additional time for guest speakers, student presentations, field trips, remediation, or other content topics.	

All courses taught in an approved CTE program must include Essential Skills embedded into the course content. The Essential Skills Framework for this course can be found at **https://www.cde.state.co.us/standardsandinstruction/essentialskills**

Unit Number, Title and Brief Description	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration
Unit 1: Bicycles: History, Culture and Opportunities	1.1 Inventory of bicycle 1.2 History and changing trends 1.3 Benefits 1.4 Bicycle Rules of the Road/Laws relating to bike use/Helmet use for under 18 1.5 Careers related to bicycles	Health and fitness Environment Bike retailers Bike Industry Engineering design & manufacturing Nonprofits and other third sector manufacturing Civil Engineering & design of cycling infrastructure (transportation and city planning) Sports, Teams, Racing		

		Marketing and media		
Unit 2: Bicycle Workshop: Operations, Shop terminology, and safety	2.1 Health and safety in the workshop - Shop safety test 2.2 Shop Terminology	A. Workbench layout B. Proper body mechanics/ergonomics when using tools and equipment C. Demonstrate knowledge of bicycle terminology, identifying components. D. Repair stand and tools E. Fasteners and Torque F. Demonstrate knowledge of bearing systems (i.e. their purpose) G. Lubricants H. Identifying various types of frames, frame materials, and usage. I. Measuring and alignment tools J. Fit and sizing bicycles		
	2.3 Administration of repair/maintenance and bicycle assembly procedures using work orders	A. Diagnosing problems with safety check forms. B. Preventative bicycle maintenance C. Corrective bicycle maintenance D. Bicycle assembly procedures administration		
	2.4 Retail business introduction as an employee	A. Pre-employment preparation - resumes, interviews, paper work, employee handbook, and what that means for work, dress code B. Employment - daily/weekly responsibilities, point of sale systems, work with co-workers, and conflict resolution C. Product merchandising and placement-merchandising and store product upkeep, stock room, and inventory and special orders. D. Customers - customer service, customer communication, phone protocol E. Service Department - understand service writing, working with the		

		customer, understanding add on sales and the process. F. The sales process - how to sell product G. Events - participation and organizational and what that entails, preparation, important aspects, before - during, - after the event. H. Marketing - all aspects of marketing and why they are important. I. Social Media - all aspects of outreach in the industry and why its important		
Unit 3: Wheels	3.1 Demonstrate ability to remove/replace both front and rear wheels- hands on skill 3.2 Develop an understanding of principles of spokes in wheel construction and terminology. 3.3 Demonstrate an understanding of spoke adjustment - wheel truing - hands on skill 3.4 Demonstrate the ability ro remove/replace tire and tube - hands on skill 3.5 Determine best course of action: repair or replace tire/tub 3.6 Demonstrate knowledge of tires & tubes - vocabulary & identification skill tests 3.7 Identify the differences in hub designs/functions			

	3.8 Demonstrate front and rear hub adjustment - hands on skill. 3.9 Using the track pump - hands on skill. 3.10 - using the compressor - hands on skill 3.11 On the Road repairs (fixing a flat on the rear wheel and patching the tube) - hands on skill			
Unit 4: Brakes	4.1 Theory and identification of brake systems; forms and function - vocabulary 4.2 Identification of different types of brake levers - vocabulary 4.3 Basics of setting up V-brakes and cable disc brakes - hands on skill			
Unit 5: Derailleurs	5.1 Set correct front derailleur limit screw positions and adjust cable tension for indexing 5.2 Set correct rear derailleur limit screw adjustment and adjust cable tension for indexing. 5.3 Install housing using correct types, lengths, hardware, and routings. 5.4 Demonstrate correct positioning and adjustment shifters			
Unit 6: Remaining Drivetrain components	6.1 Identifying bottom brackets, bearings, cranks, chainsets, pedals,			

	freewheels/cassettes and chains. 6.2 Identifying and understanding compatibility issues with regards of different types of BB's & cranks: 1piece, 2-piece, 3-piece vocabulary 6.3 Hands on skill - adjusting BB's, fitting pedals, fitting chains 6.4 Hands on Skill - removing and replacing freewheels and cassettes			
Unit 7: Headsets and piloting	7.1 Theory and identification of parts of threadless headset and steering 7.2 Theory and identification of parts of threaded headsets and steering 7.3 Identification of different types and sizes of headsets, handlebars, and stems. 7.4 Hands on skill - setting up stems height and reach and adjustment headsets 7.5 Hands on skill - setting up saddles and seatposts for optimum efficiency and comfort 7.6 Demonstrate knowledge of seatposts, seat clamps, post clamps, and saddles in terms of their proper installation, fit, and function.			
Unit 8: Bike Assembly	8.1 Build a bike from a "box"			

	8.2 Use UBI or Park Tools checklist(s) 8.3 Practice setting up this demo bike at least 3 times each time instructor checks build for quality and quizzes student on procedures orally and/or with written work orders/written checklist 8.4 Written work orders - hands on skill with inventory paperwork, custom order paperwork, and workshop filing/admin	A. First time walk through with instructor B. Second time with bench partner help/collaboration C. Third time individually - graded for quality and measurable skill attainment.		
Unit 9: E-Bike Introduction	9.1 E-Bike Definitions 9.2 Rules and Restrictions 9.3 Technology Overview 9.4 Workshop Tooling & Safety	E-Bike technology concepts, PeopleForBikes classification, basic control paradigms - What is an e-bike? - How are e-bikes categorized - Why should bicycle mechanics learn about e-bikes. Where to ride, or access points can be identified using the 3-class system. Some technology may not be in-line with the 3-class system - Where can e-bikes be ridden? - Do local access laws and private land rules differ from state access laws? - Are there e-bikes that do not comply with the 3-class system? Battery, motor, controller, HMI, and control paradigm are main components of e-bikes - What parts make up an e-bike? - What are mid-drive bikes, and what are hub-drive bikes? - What is a closed system, and what are its advantages? A common bicycle workshop can work well for e-bke service. Considerations include; clean, well-lit, ventilated and climate		

		controlled space. Heavy duty repair stands, close toed shoes and other safety gear will ensure mechanics have good and safe working experience. - What do I need to know about e-bkes in order to work on them? - What is the most important thing to remember in the unlikely case of a battery thermal event? - What specific tools will I need to know how to use in order to work on e-bikes?		
Unit 10: First year capstone: The Business of Bicycle Retail	10.1 Introduction to the Bike Industry and business operations including 360-degree safety in the workplace. 10.2 Retail business introduction	A. Business Planning a. markup & margin b. Financial - profit & loss/balance sheet c. Overhead and business operations B. Management/employee relationships, OSHA, Risk assessment in the industry C. Customer Service/professionalism/ethics in business D. Daily operations/handling money E. Stock- inventory and open to buy - product cycles and availability F. Ordering/receiving/merchandising of products and services G. POS Systems (Point of Sale) - Introduction of Use a. Why POS systems are valuable to business. b. Computer skills: Introduction to system, enter customer, a sal, a repair tage c. Inventory classroom - beginning - middle - end year		

		d. Enter an order - receive an order e. Analytics: Customer, sales, repairs, inventory H. Liability - safety I. Work Readiness skills - hands on practice of job interviews , personal public profile.		
Unit 11: Product Design, development, engineering, manufacturing, industry career opportunities	11.1 Education and Career Opportunity Considerations 11.2 College Major Options & Related Job Positions	A. Combine participation, technical skills, and retail experience with a related college degree. B. Beyond recognized “retail” employment is a range of industry career opportunities C. A variety of college degrees should be considered if a career in the industry is desired D. Several college majors provide skills & experience directly related to industry job opportunities		
Unit 12: Portfolio, and college/career readiness	12.1 College Readiness: Potential Job opportunities 12.2 Apprenticeship or summer job preparation 12.3 End of year presentations; portfolio and projects 12.4 Lab books graded 12:5 Level 1 final exam 12.6 Awarding certificates			
