

STEM Framework Input Meeting

Tonja Norwood, STEM Division Manager




OKLAHOMA
CareerTech

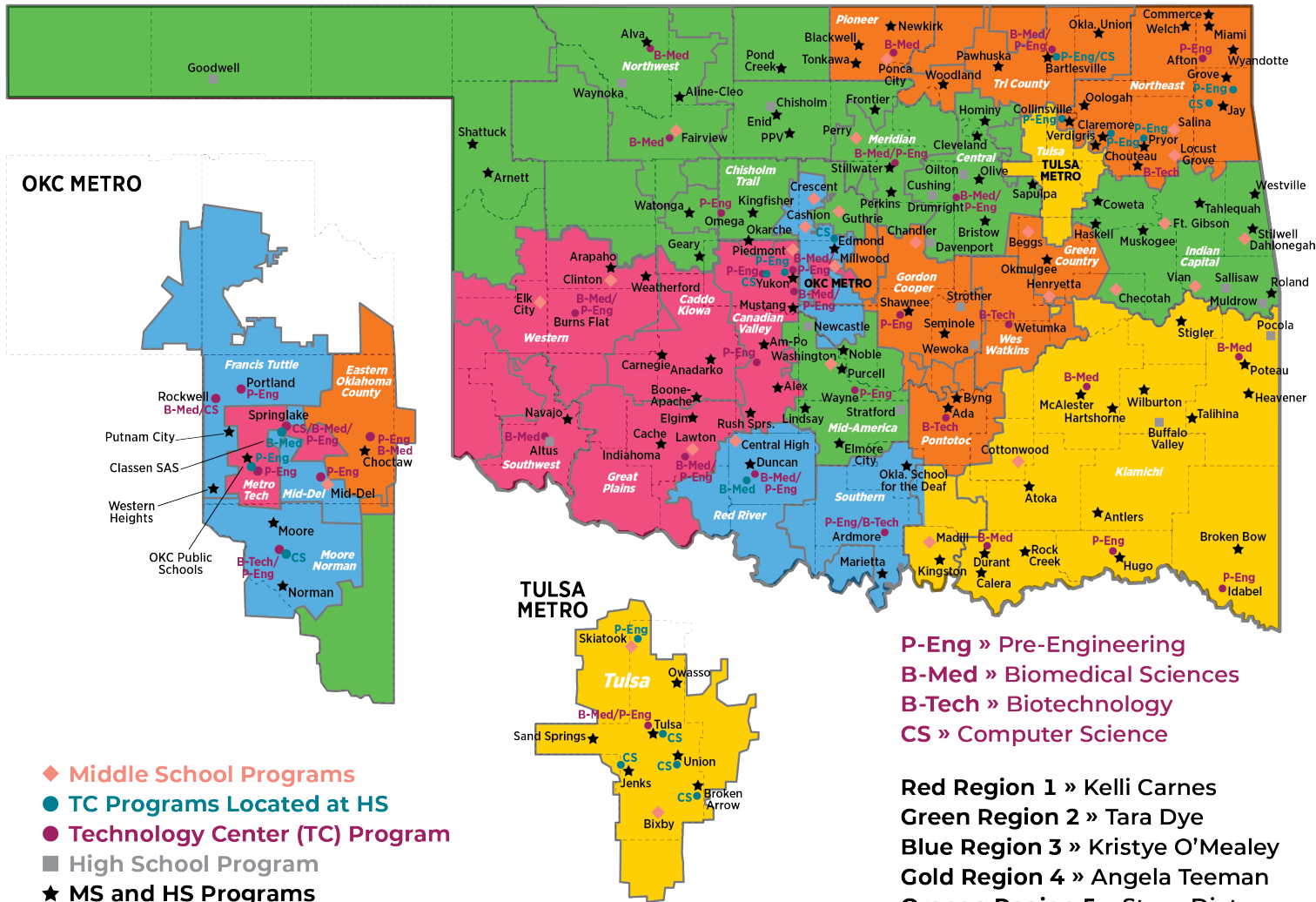
STEM

Science, Technology,
Engineering & Mathematics
TSA student organizations

Today's Goals

- > Meet STEM Team
 - > Navigate Website
 - Programs
 - Sequences
 - Certification
 - > Program Hours Recommendations
 - > Feedback on Recommendations
- 

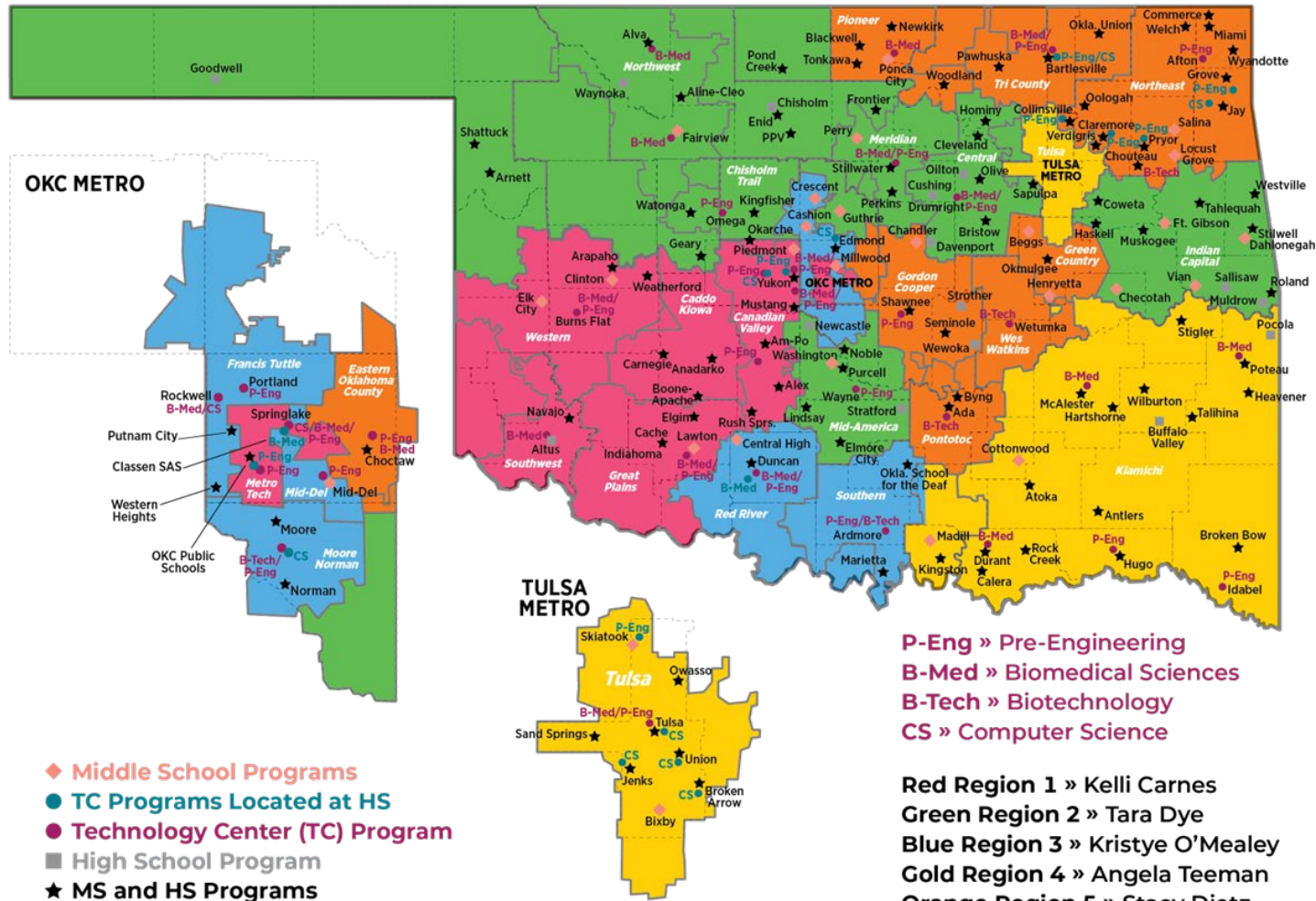
Region 1 Kelli Carnes



Gateway & Computer Science
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405.743.5422

Region 2 Tara Dye



- ◆ Middle School Programs
- TC Programs Located at HS
- Technology Center (TC) Program
- High School Program
- ★ MS and HS Programs

P-Eng » Pre-Engineering
 B-Med » Biomedical Sciences
 B-Tech » Biotechnology
 CS » Computer Science

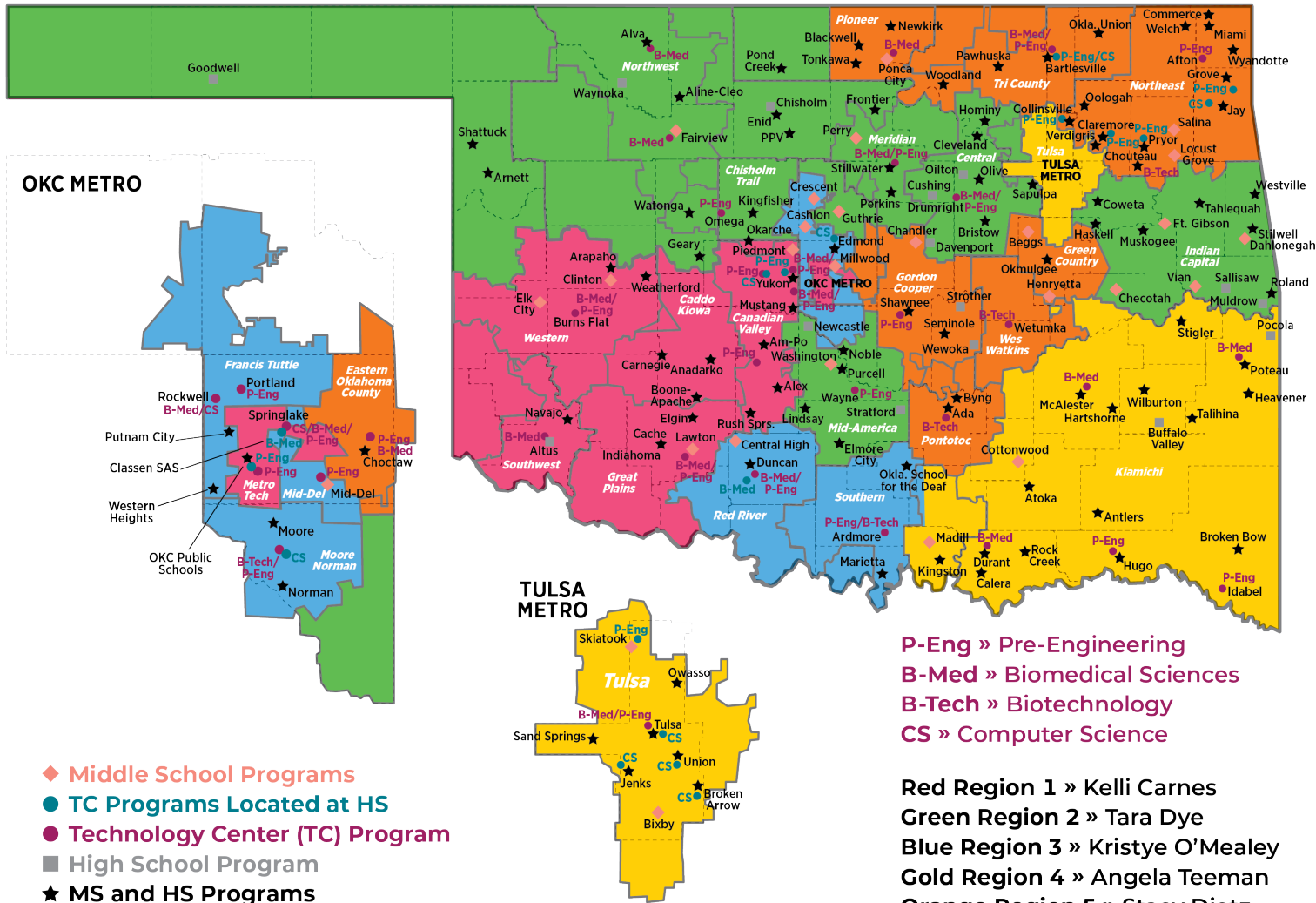
Red Region 1 » Kelli Carnes
 Green Region 2 » Tara Dye
 Blue Region 3 » Kristye O’Mealey
 Gold Region 4 » Angela Teeman
 Orange Region 5 » Stacy Dietz



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 Technology Engineering
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Region 3

Kristye O'Mealey

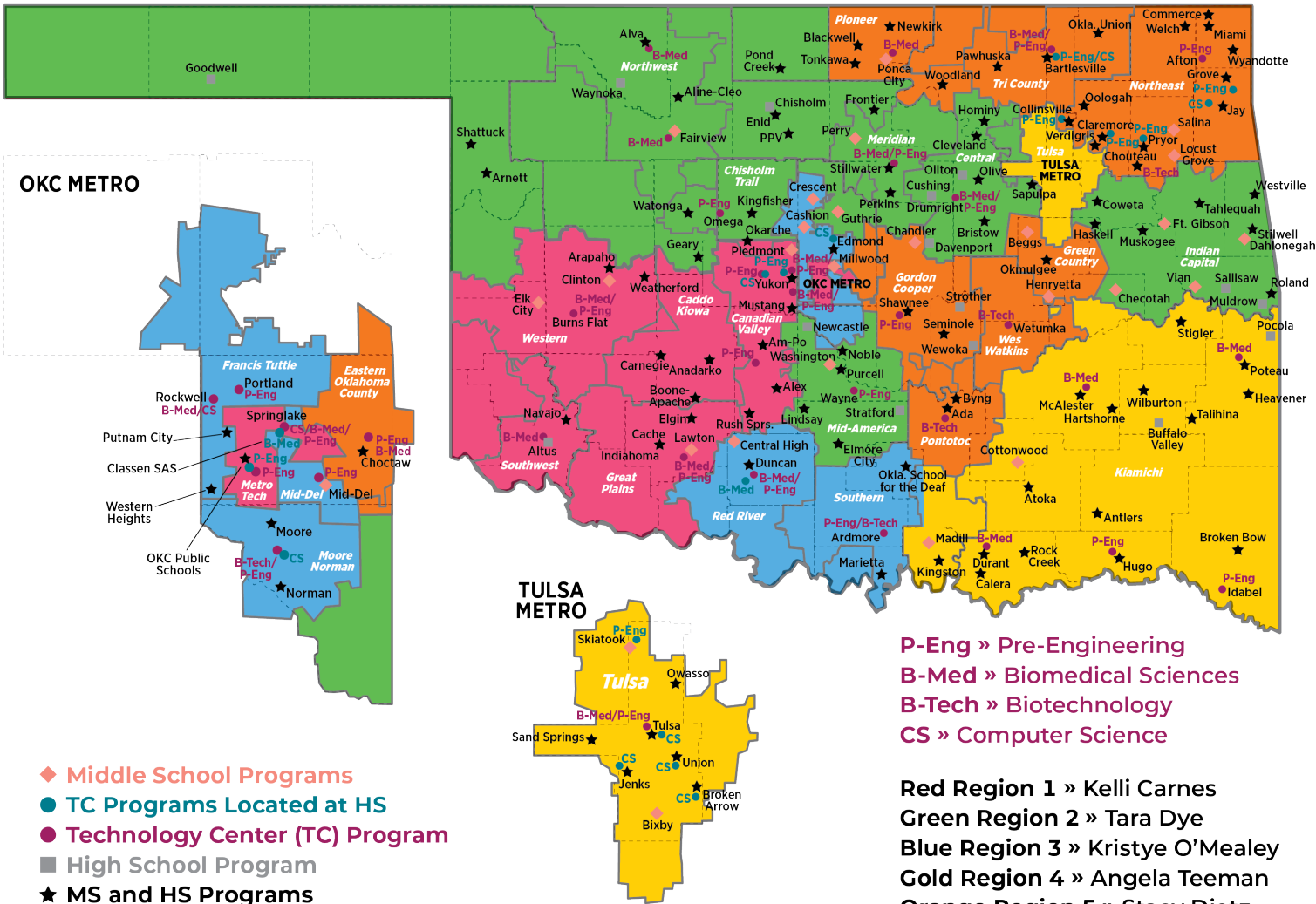


Aerospace

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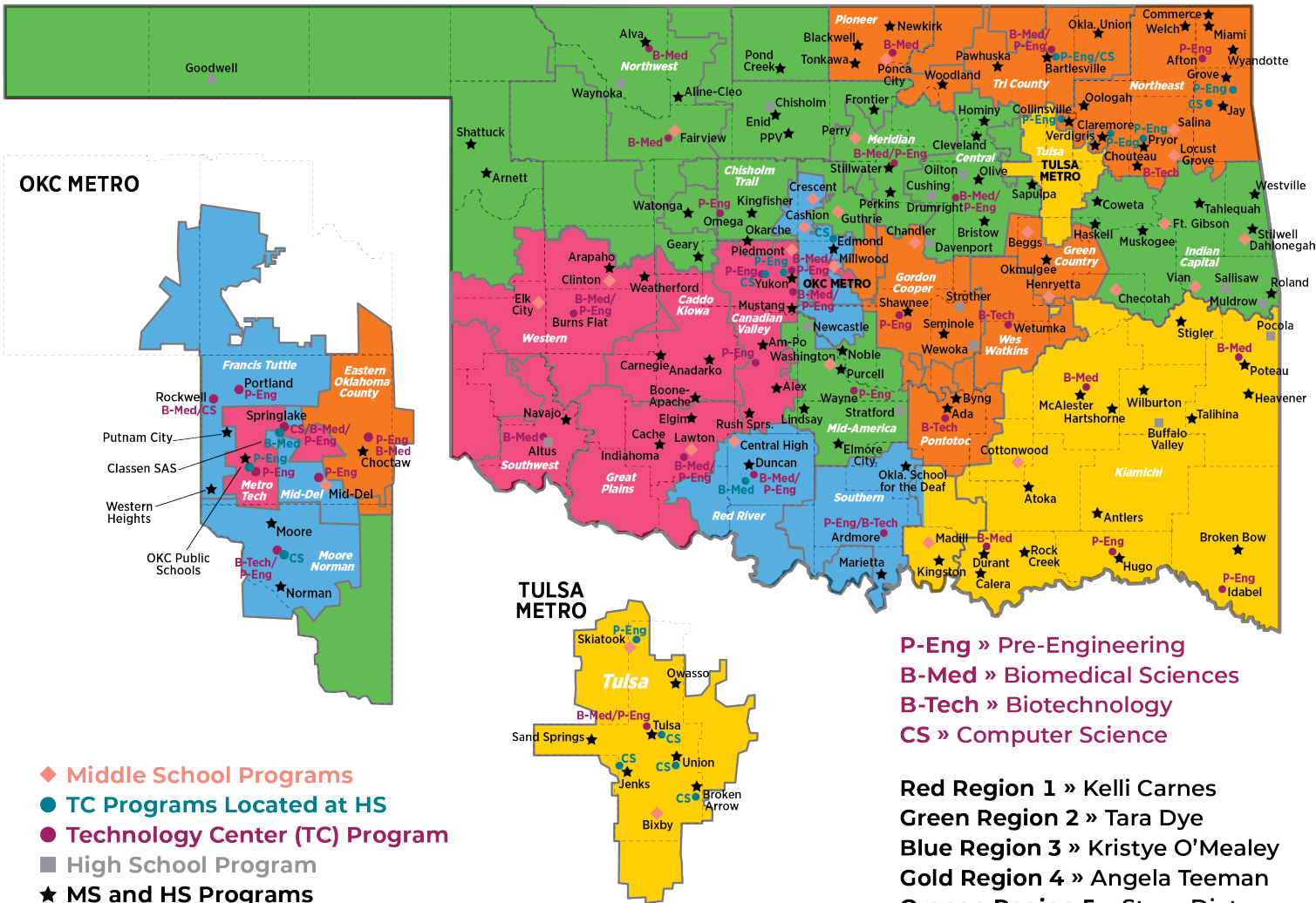
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Region 4 Angela Teeman



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Region 5 Stacy Dietz



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P-Eng » Pre-Engineering
 B-Med » Biomedical Sciences
 B-Tech » Biotechnology
 CS » Computer Science

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Program Information

Science, Technology, Engineering and Mathematics

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STEM Programs

NEW PROGRAMS >

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BIOMEDICAL >

BIOTECH >

COMPUTER SCIENCE >

MS GATEWAY >

PRE-ENGINEERING >

ROBOTICS >

TECHNOLOGY ENGINEERING >

<https://oklahoma.gov/careertech/educators/stem/programs.html>

Framework Information – State Program

State Program Code	State Program Name	Description	Program Hrs.
SC0026005	Aerospace Program	Aerospace Program	480
SC0026006	Aerospace Program - Advanced	Aerospace Progra...	960
SC0026000	Biomedical Science and Medicine Program	Biomedical Scienc...	480
SC0026007	Biomedical Science and Medicine Program - Advanced	Biomedical Scienc...	960
SC0026008	Biotechnology Program	Biotechnology Pro...	480
SC0026001	Biotechnology Program - Advanced	Biotechnology Pro...	960
SC0026009	Computer Science Program	Computer Science...	480
SC0026002	Computer Science Program - Advanced	Computer Science...	960
SC0016001	Pre-Engineering Program	Pre-Engineering P...	480
SC0026010	Pre-Engineering Program - Advanced	The Pre-Engineeri...	960
SC0026004	Robotics Engineering Program	Robotics Engineer...	480



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Biomedical Science

The Biomedical Science and Medicine State Program Area is an academically intense, project-based program which focuses on the biomedical field. Students will be able to test for college credit through AP courses and successfully transition to post-secondary.

[Sequence of Courses and Course Description Guide](#)

CTIMS	OCAS	STATE PROGRAM	HRS
SC0026000	9852	Biomedical Science & Medicine	480
SC0026007	9870	Biomedical Science & Medicine - Adv	960

Resources

- [Project Lead the Way \(PLTW\)](#)
- [Syllabi](#) (login to ctYOU.org required)
- [PLTW Professional Development](#)
- [PLTW Get Started](#)
- [Investment Tool](#)
- [AP & PLTW Student Achievement Process](#)
- [PLTW Solution Center](#)
- [PLTW Training Guarantee](#)

Sequence of Courses

Pathway: Engineering and Technology					CareerTech Approved College Prep Mathematics and Science Courses				
OCAS	Math	OCAS	Math	OCAS	Science	OCAS	Science		
4830	Advanced Studies in Math I	4760	AP Statistics	5055	AP Chemistry	5211	Physics I		
4831	Advanced Studies in Math II	4612	Calculus	5121	AP Environmental	5212	Physics II		
4412	Algebra II	4520	Geometry	5213	AP Physics 2: Algebra-Based				
4413	Algebra III	4611	Pre-Calculus (60 or 120 hours)	5216	AP Physics C: Mechanics				
4615	AP Calculus AB	4614	AP Pre-Calculus	5217	AP Physics C: Electricity and Magnetism				
4616	AP Calculus BC	4740	Statistics & Probability	5051	Chemistry I				
		4750	Trigonometry (60 hours)						

Pathway: Engineering and Technology									
State Program		1	2	3	4	5	6	7	8
SC0016001 Pre-Engineering Program 480 hours	Pre-Engineering - Adv 1440 hours	8878 Engineering Essentials 120 hours	8709 PLTW IED 120 hours	8710 PLTW POE 120 hours	PLTW - Engineering Specialty Course 120 hours	PLTW - Engineering Specialty Course 120 hours	8716 PLTW Capstone 120 hours	College Prep Math Year 1-3 360 hours	College Prep Lab Science Year 1-3 360 hours
	Pre-Engineering - Adv 960 hours	8878 Engineering Essentials 120 hours	8709 PLTW IED 120 hours	8710 PLTW POE 120 hours	8716 PLTW Capstone 120 hours	College Prep Math Year 1-2 240 hours	College Prep Lab Science Year 1-2 240 hours	CIP and SOC Suggestions CIP: 14.0101 - Engineering, General SOC: 17-2199.00 - Engineers, All Others Or CIP: 14.0102 Pre-Engineering SOC: 99-9999 No Match	
	Pre-Engineering - Adv 480 hours	8878 Engineering Essentials 120 hours	8709 PLTW IED 120 hours	8710 PLTW POE 120 hours	8716 PLTW Capstone 120 hours				
	PLTW Engineering Specialty Courses	8711 Digital Electronics 120 hours	8712 Computer Integrated Manufacturing 120 hours	8713 Civil Engineering & Architecture 120 hours	8854 Environmental Sustainability 120 hours	8715 Aerospace Engineering 120 hours			

Course Information

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[OCAS](#) | [Correcting OCAS](#) | [Capstone Courses](#) | [Electronic Transcript](#) |

[Graduation Requirements](#) | [Oklahoma's Promise](#) | [Standards](#) | [AP Courses](#)

Program Information

[COURSE DESCRIPTION GUIDE >](#)

[MS SEARCH COURSES >](#)

[HS SEARCH COURSES >](#)

[STEM CAREER CLUSTER >](#)

[SEQUENCE OF COURSES >](#)

[ASSESSMENT GUIDE >](#)

OCAS Subject Codes

[ALL CAREERTECH OCAS CODES >](#)

[STEM OCAS CODES >](#)

[SDE OCAS CODES >](#)



<https://oklahoma.gov/careertech/educators/stem/course-information.html>

Course Descriptions Guide



Science, Technology, Engineering and Mathematics
 Grades 6-12 Course Descriptions
 OCAS Subject Codes for FY25 - CESI Course Codes

High School Courses

CESI Pathway Codes:
 SC001 Engineering and Technology
 SC002 Science and Mathematics

- 8704 Advanced Biotechnology I – 1 unit** (CESI: ST00026)
 This is a course that is intended for students who have excelled in Biotechnology I and II. It will challenge them to gain knowledge in upper-level biochemistry, microbiology, and lab techniques. Lab reports are an integral part of this course, as well as bioinformatics. Students will be expected to do independent research projects.
- 8717 Advanced Biotechnology II (Oklahoma’s Promise – Science Credit) – 1 unit** (CESI: ST00040)
 This is a course that is intended for students who have excelled in Biotechnology I and II and have taken Advanced Biotechnology I. This course encompasses upper-level biochemistry, microbiology, and lab techniques. Lab reports are an integral part of this course, as well as bioinformatics. Students will be expected to do independent research projects.
- 8826 Advanced Design Applications – 1 unit** (CESI: ST00125)
 This is an advanced Engineering design course for upper-level High Schools students. This course allows students to research and apply technology principles to a hands-on project.
- 8882 Advanced Mechanical Design Engineering (Oklahoma’s Promise – Computer Credit) – 1 unit** (CESI: ST00275)
 Students will develop an understanding of the attributes of design and the design process. Students learn the value of sustainable design with Autodesk Fusion 360 and gain future career skills.
- 8160 Advanced Programming (Oklahoma’s Promise – Computer Science Credit) – 1 unit** (CESI: ST00316)
 Students will be able to demonstrate an understanding of programming languages by implementing and writing programs employing various techniques.
- 8866 Advanced Robotics Engineering (Oklahoma’s Promise – Computer Credit) – 1 unit** (CESI: ST00255)
 This is an advanced robotics engineering and automation course that delivers thorough and engaging STEM education. This course should deliver comprehensive, standards-based instruction through relevant activities and engagement.

Science, Technology, Engineering, Mathematics Grades 9 – 12			
CESI Pathways: SC001 Engineering and Technology or SC002 Science and Math			
OCAS	Course	CESI	Oklahoma’s Promise
8149	Desktop Publishing and Graphic Design	ST00313	Computer
8150	Multimedia & Image Management Techniques	ST00314	Computer
8153	Fundamentals of Web Design	ST00315	Computer
8160	Advanced Programming	ST00316	Computer Science
8169	Fundamentals of Technology	ST00317	Computer
8191	Digital Media Production	ST00318	Computer
8255	Internet of Things (IoT) Fundamentals	ST00319	Computer Science
8256	Cybersecurity Basics	ST00320	Computer Science
8559	Medical Terminology	ST00301	
8701	Survey of Biotechnology	ST00025	
8702	Biotechnology I	ST00017	
8703	Biotechnology II	ST00018	Science
8704	Advanced Biotechnology I	ST00026	
8705	STEM Capstone (Capstone Credit)	ST00027	
8706	PLTW Principles of Biomedical Science	ST00003	Science
8707	PLTW Human Body Systems	ST00001	Science
8708	PLTW Medical Interventions	ST00004	Science
8709	Intro to Engineering Design	ST00023	Computer
8710	Principles of Engineering	ST00024	Computer
8711	PLTW Digital Electronics	ST00021	Math
8712	PLTW Computer Integrated Manufacturing	ST00041	Computer
8713	PLTW Civil Engineering and Architecture	ST00019	
8715	PLTW Aerospace Engineering	ST00013	Science
8716	PLTW Capstone	ST00022	
8717	Advanced Biotechnology II	ST00040	Science
8718	Biomedical Health Careers	ST00060	
8719	PLTW Biomedical Innovation (Capstone Credit)	ST00005	Science
8720	Crime Scene Investigation	ST00278	Science
8721	STEM Internship	ST00328	
8722	Quantum Computing	ST00302	
8825	Advanced Technological Applications	ST00191	
8826	Advanced Design Applications	ST00125	
8827	Engineering Design	ST00192	
8828	Technology Foundations	ST00134	

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Certification and Assessment

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Assessment Guides

Need to know what certifications are aligned to a course? Click Testing Guide for the information.

STEM ASSESSMENT GUIDE >

APPROVED ASSESSMENTS >

CAREERTECH STUDY GUIDES >

You don't see a test you want to have on the approved list? Complete the approval from below and send it to your program specialist in STEM. [STEM Contact Information](#)

ASSESSMENT REQUEST >

ASSESSMENT PROVIDERS >

CERTIFICATION FINDER >



College Credit



Cooperative Agreements



Technical Assessment



Course List



Oklahoma State Regents



Assessment Guide

OCAS Course Number and Name	Choice of Assessment/Certification Test				Hrs.
	Certification - Owner of Test	PLTW Micro-Credential	Precision Exams by YouScience Micro-Credential	Other Micro-Credential	
2024-2025 STEM Credential/Certification Guide					
8704 Advanced Biotechnology I • Prerequisite Course: BigTech II	Biotility – University of Florida: Biotechnician Assistant Credentialing Exam (8584) CLEP Natural Science (6405)		Biotechnology (8583)		120 hrs.
8717 Advance Biotechnology II • Prerequisite Course: Advanced BigTech I	Biotility – University of Florida: Biotechnician Assistant Credentialing Exam (8584) CLEP Natural Science (6405)		Biotechnology (8583)		120 hrs.
8826 Advanced Design Applications • Prerequisite Course: Engineering Design	Certiport : • Autodesk Inventor Certified User (2756) • Autodesk Revit Certified User (2757)		Engineering Principles I (4598) Engineering Principles II (4599)	Engineering by Design: Engineering Design (4601) Adv Game Art Design (4602)	120 hrs.
8882 Advanced Mechanical Design Engineering • OK Promise Computer Credit	Certiport : Autodesk Fusion 360 Certified User (2764)			MakerBot: MakerBot 3D Printing (0624)	120 hrs.
8160 Advanced Programming • Prerequisite Course: None • OK Promise Computer Credit	AP Computer Science A Exam (1727) OU: Code Sooner (0207) Certiport : Information Technology Specialist Java (*) Information Technology Specialist Python (0272)		Choose 1: Computer Program IA (0210) Computer Program II Java (0211)	SHL Talent Central: Java (0691) TOSA: JavaScript	120 hrs.
8866 Advanced Robotics Engineering • Prerequisite Course: <i>Robotic Engineering</i> • OK Promise Computer Credit	Certiport : Autodesk Inventor Certified User (2756) National Coalition of Certification Center: Fundamentals of Robotics (1483) Applied Robotics (1484)		Robotics II (4594)	REC Foundations: Robotics (4595) Pre-Engineering (4596) Carnegie Mellon University: Coding and Computational Thinking with VEX V5 (0203) MakerBot: MakerBot 3D Printing (0624)	120 hrs.
8825 Advanced Technological Applications • Prerequisite Course:				MakerBot: MakerBot 3D Printing (0624)	120 hrs.
8862 Advanced Tech for Design Production Prerequisite Course:	Certiport Certiport			Engineering by Design: Engineering Design (4601) Adv Game Art Design (4602)	120 hrs.
8868 Aeroponics/Hydroponics/Aquaponics • Prerequisite Course: None					120 hrs.
Aerospace Capstone	Remote Private Pilot Airplane – FAA Part 61 (2421)				

Certiport:

- Autodesk Inventor Certified User (2756)
- Autodesk Revit Certified User (2757)

Questions, Recommendations, Concerns

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