# College of Commissioner Science
# Sam Houston Area Council
# Boy Scouts of America

**Project report for completion of**
**Doctor of Commissioner Science**

## Commissioner Transcript System

**Michael H. Lampkin**
**North Division Commissioner, Sam Houston Area Council**
**December 2019**

## Table of Contents

Background ..... 3
Objective and Scope ..... 4
Planning and Execution ..... 5
Structure ..... 6
Post Project Review ..... 8
Leaving a Legacy ..... 9
Appendix ..... 10
- Definitions ..... 10
- Front-end (Visitor) view 1 of 2 ..... 11
- Front-end (Visitor) view 2 of 2 ..... 12
- “Admin” login view ..... 13
- “Admin: Home” view ..... 14
- “Admin: Courses” page view ..... 15
- “Admin: Courses - Add” page view ..... 16
- “Admin: Courses - Edit” page view ..... 17
- “Admin: Users” page view ..... 18
- “Admin: Users - Add” page view ..... 19
- “Admin: Users - Edit” page view ..... 20
- “Admin: Transcripts by User - Edit” view ..... 21
- “Admin: Transcripts by Course - Add” view ..... 22

# Background

For many years, the Sam Houston Area Council (SHAC) has held an annual training event for Commissioners. Up until 2009, the training event was called the “Commissioner Conference.” In 2010, the Sam Houston Area Council transitioned to the Commissioner College curriculum to utilize the Boy Scouts of America (BSA) National Council’s training curriculum. In doing so, the need for tracking individual trainings toward degree requirements and easy access to those records by individuals became paramount.

The idea of building an online database with a friendly user-interface and a customizable secure administrative area was discussed. I volunteered to take on this project with guidance from other IT professionals and longtime council commissioners.

Historical data had traditionally been organized by Troxel Ballou (2008 Commissioner Conference chair). Troxel kept all of the historical data in MSAccess. As the Commissioner College process was being planned, Troxel Ballou, Stan Stanley (Council Commissioner, at that time), Farrell Gerbode (Assistant District Commissioner) and I agreed that MSAccess was not the best solution. Additionally, it was not easily accessible by the participants to review their transcripts and their future needs. In 2011, we made initial plans to create an online method (a web-based application) to manage the data. Since I had completed my bachelor's and master's degrees at the Atlanta Area Council's Commissioner College in the early 90's, we decided that this would be an appropriate doctoral project. Stan assigned Troxel as my project counselor.

In early 2012, Troxel, Farrell and I met over lunch to develop a doctoral project which would have me build an online database with a publicly searchable interface as well as a password protected administrative interface...the **Commissioner Transcript System** (**CTS**). We scoped the project, set milestones, and set a deadline to launch prior to the 2012 Commissioner College.

We met a few more times in 2012 and I continued to write the code and develop the CTS project prior to the 2012 Commissioner College. The CTS was successfully launched prior to the December 2012 deadline and minor updates were made in the years following. At the time, there were no doctoral candidates, so nothing was discussed about applying for the degree and no write-up was requested regarding the completion of the project.

In 2013, Troxel left the Scouting program and Bob Rosensteel (Commissioner College registrar) was tasked with data input for the CTS. I kept the CTS software updated and made yearly improvements, such as allowing users to submit their own updates (e.g. courses taken out of council or at other sanctioned events).

# Objective and Scope

**I. Primary Objective:**

To provide a convenient resource for recording, reviewing, and updating participant data for the Sam Houston Area Council College of Commissioner Science.

**II. Primary Project Scope:**

**a) For the participant:**

- Provide an interface for participants to search their own records; possible options include: searchable by last name, BSA ID (when available), or email address (when available)
- "Completed Classes" listing sheet
- "Commissioner Degree Progress" sheet
- Track dates of class/course completion
- Allow user to set goals for future courses
- (Optional) Provide a form for submitting change requests

**b) For the administrator(s):**

- Provide an interface for participant search and all documentation (as listed above) available for every participant
- Form for adding/editing/deleting of participants' data
- Form for adding/editing/deleting course code / name / description
- Review and approve change requests from participants

# Planning and Execution

**Potential Problems**

- Security for over 1200+ individuals:
    - Password protection: It was determined that the system would use encrypted passwords, when passwords were needed.
    - Code injection: Code Injection is the general term for attack types which consist of injecting code that is then interpreted/executed by the application. It was determined that all queries would be handled with a code validator and, if possible, no variables would be sent in a URL string.

- Data loss:
    - Database data and web site code would be put on a daily back-up schedule. At least once a month, database data and web site would be backed up off-site.

**Development Strategy**

*Initial development:* In 2012, the site was fully developed in the language ColdFusion pulling data from a MySQL database. At the time, ColdFusion was the common language with which I was developing other corporate web applications. The only negative aspect of this language was that it was a commercial language and required a web server which supported ColdFusion, so a web hosting company required an additional monthly licensing fee for the language. I covered the expense of the server from January 2012 until the project was cancelled in early 2018.

*Secondary development:* In late 2018, the council commissioner team (Dan Goetzman and Forrest Bjerkaas) asked me to revive the web site. The former commercial server hosting service had been cancelled and the previous web app no longer existed in an operational state. I took the opportunity to rebuild the site in a non-commercial or open source (free) language. The entire site was rewritten in the language PHP and the database remained in MySQL. The web application currently exists at my domain, ScoutCrest.org dedicated to Commissioner Service and is hosted at HostGator.

The CTS was built in the Bootstrap structure allowing for a uniform view across platforms (Mac, PC, etc.) and browsers.

**Execution**

The developmental milestones were met and approved in 2012 and the site was launched successfully prior to the 2012 Sam Houston Area Council Commissioner College. Subsequent years saw minor upgrades and development.

# Structure

The table structures are designed as such:

**Courses: contains all data for courses**

- id.....Tracking number for each course listing
- code.....A 4-digit code for each course
- type.....Designation ACS, BCS, MCS, DCS, or CED
- number .....Course number for each course
- name .....String name describing each course
- hide.....Simple method of removing a course without deleting the data

**Users: contains all data for users**

- id.....Tracking number for each user
- first_name.....First name of each user
- last_name.....Last name of each user
- dob .....Date of birth
- bsaid.....BSA Identification number (when known or submitted by user)
- faststart.....Date of Fast Start Training taken
- basic .....Date of Commissioner Basic Training taken
- comm_key .....Date of Commissioner Key received
- arrowhead .....Date of Arrowhead Award received
- distinguished .....Date of Distinguished Commissioner Award received
- bcs.....Date of Bachelor of Commissioner Science received
- mcs.....Date of Master of Commissioner Science received
- dcs.....Date of Doctorate of Commissioner Science received
- comments.....Comments as needed
- address1.....User address line 1
- address2.....User address line 2
- city .....User city
- state.....User state
- zip .....User zip
- phone .....User phone
- phone2 .....User alternate phone (optional)
- email.....User email address
- pwrd.....User password (encrypted)
- pwrd_salt .....User password encryption salt
- unit_type.....User unit type (Pack, Troop, Post, Ship, etc.)
- unit_number .....User unit number
- district .....User district
- council .....User council
- last_update.....Last update of user information
- admin.....Indicator whether this user is Administrator of site

- hide.....Simple method of removing a user without deleting the data

**Transcripts: joins data from Courses and Users tables**

- id .....Tracking number for each user
- uID.....ID number for a particular user
- coID .....ID number for a particular course
- type.....(optional) Type of course
- number .....(optional) Number of course
- year .....Year that course was taken by user
- last_update.....Last update of transcript

# Post Project Review

The primary goal for this project was “to provide a convenient resource for recording, reviewing, and updating participant data for the Sam Houston Area Council College of Commissioner Science.” I believe this project has accomplished that mission.

**How did this project improve the previous method?** The pre-2010 records were kept in MS Access. To review your records, you had to contact the person who held the records and ask them for a printout of your records. To enter records, only one person at a time could enter data and the entire database had to be moved from registrar's computer to registrar's computer for multiple people to work on it. The process was extremely limited and time consuming. The centralization of the transcripts made it easier and more spontaneous for users to review their transcripts. Record keeping can be managed by any number of registrars who are given authorization to access the “admin” section of the site. Updates and corrections are made by the registrars in real-time and viewable by the user instantly.

**What problems did I encounter and what did I learn?** The current version of the application is written in PHP with a MySQL database. The majority of problems I encountered were simply minor coding mistakes due to the learning curve as I learned the PHP language having no previous experience with it. I now use PHP daily in my professional life, so I see areas of code in this application which could be written more “gracefully”. Before releasing this to the general public, I will attempt to tidy up those areas of code.

**How can I improve this project?** GitHub.com is a central web site which allows developers a public platform to store their code and also allows other developers the opportunity to submit changes/improvements to the code. I plan to release this on GitHub in the near future to allow other developers the opportunity to copy and launch this for their councils. Releasing the code to the community will also allow other developers to submit enhancements which will ensure that this project grows and lives on without me.

## Leaving a Legacy

It is my wish to provide the CTS for future Commissioner Colleges in the Sam Houston Area Council and allow other councils to use the CTS. My plan is to provide the software free-of-charge at GitHub which will allow collaboration by all users through the version-controlling Git.

# Appendix

## 1.1 Definitions

These definitions are directly copied from Wikipedia.org.

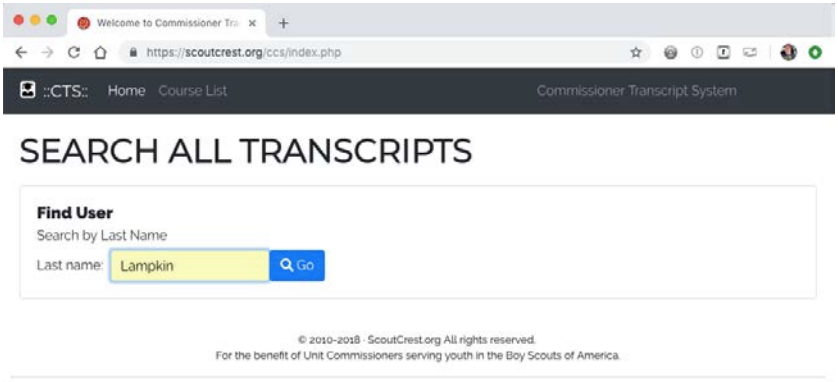
1. **Bootstrap** is a free and open-source front-end framework for designing websites and web applications. It contains HTML- and CSS-based design templates for typography, forms, buttons, navigation and other interface components, as well as optional JavaScript extensions. Unlike many earlier web frameworks, it concerns itself with front-end development only.

2. **Git** is a version-control system for tracking changes in computer files and coordinating work on those files among multiple people. It is primarily used for source-code management in software development, but it can be used to keep track of changes in any set of files. As a distributed revision-control system, it is aimed at speed, data integrity, and support for distributed, non-linear workflows.

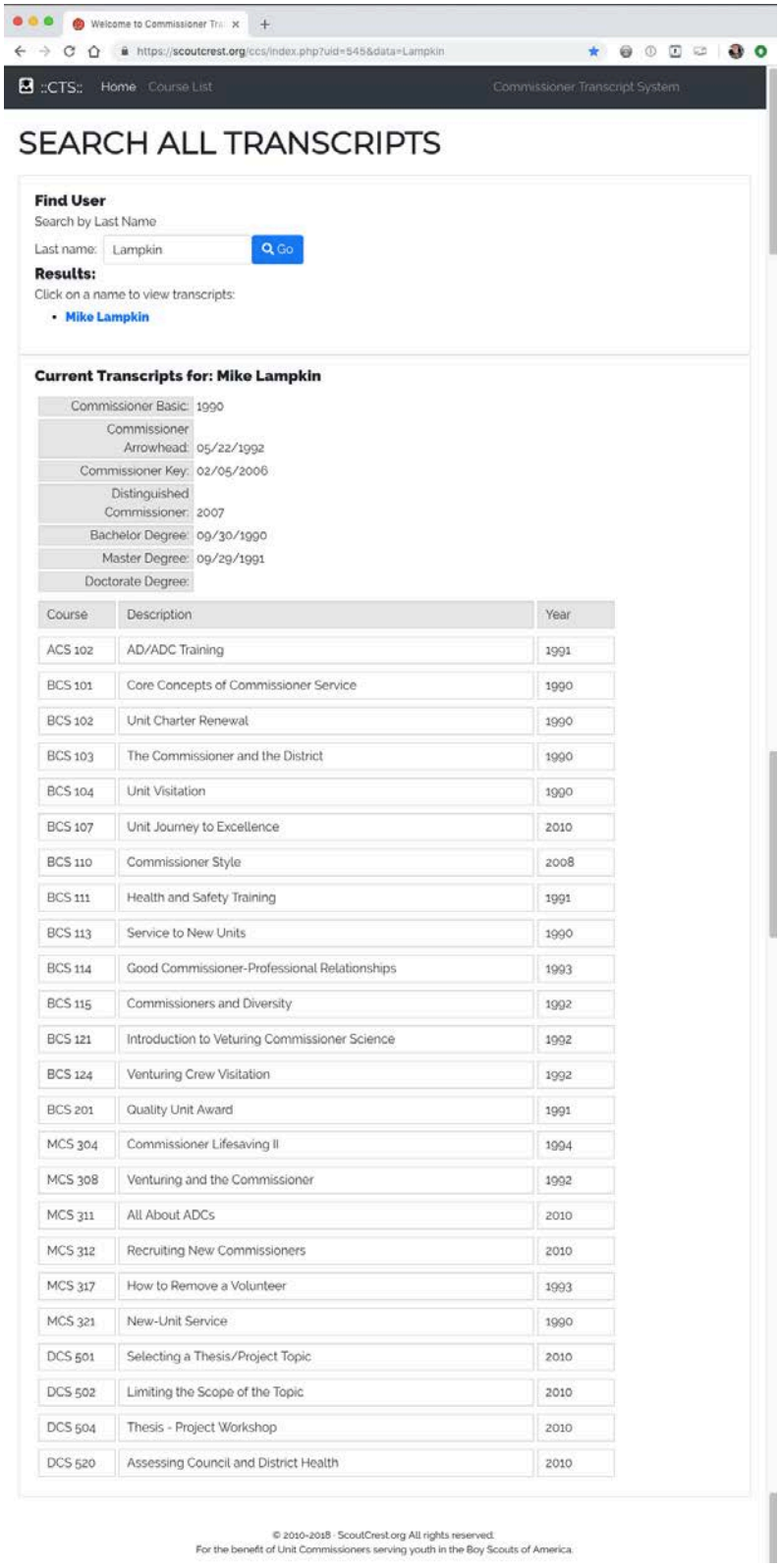
3. **MySQL** is an open source relational database management system (RDBMS). Its name is a combination of "My", the name of co-founder Michael Widenius's daughter, and "SQL", the abbreviation for Structured Query Language. The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation. For proprietary use, several paid editions are available, and offer additional functionality.

4. **PHP: Hypertext Preprocessor** (or simply PHP) is a server-side scripting language designed for Web development, and also used as a general-purpose programming language. It was originally created by Rasmus Lerdorf in 1994; the PHP reference implementation is now produced by The PHP Group. PHP originally stood for Personal Home Page, but it now stands for the recursive initialism PHP: Hypertext Preprocessor.

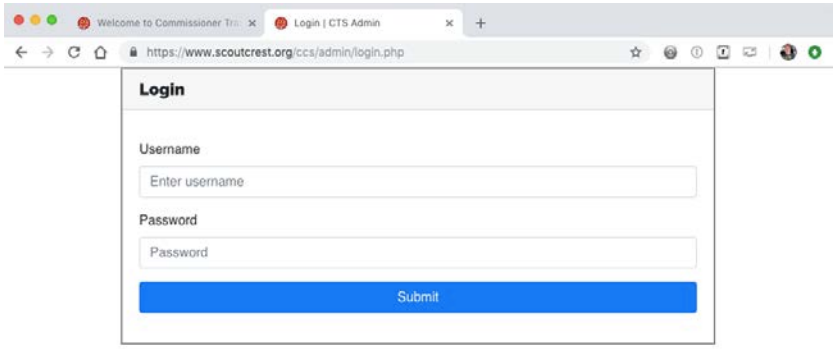
## Front-end (Visitor) View: Step 1 of 2



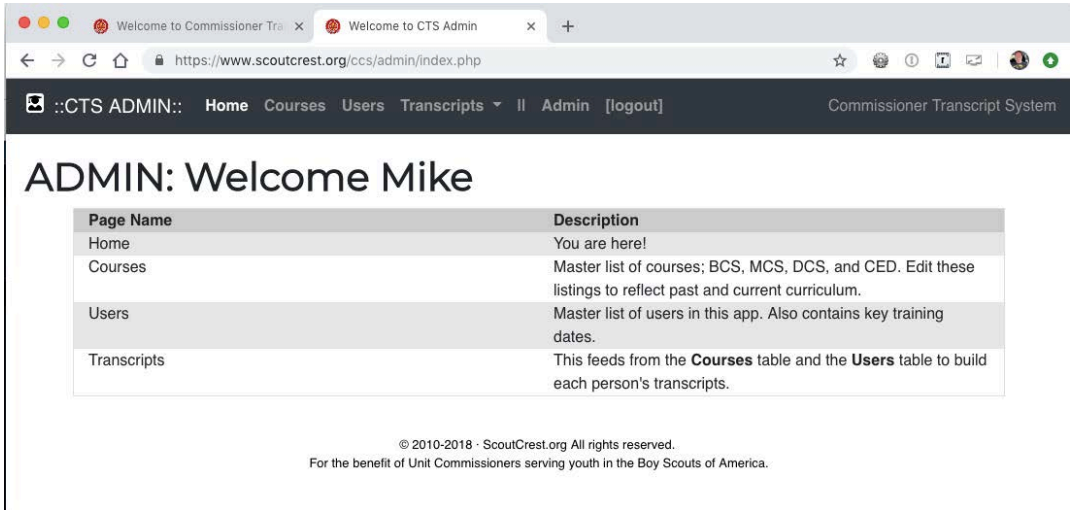
## Front-end (Visitor) View: Step 2 of 2



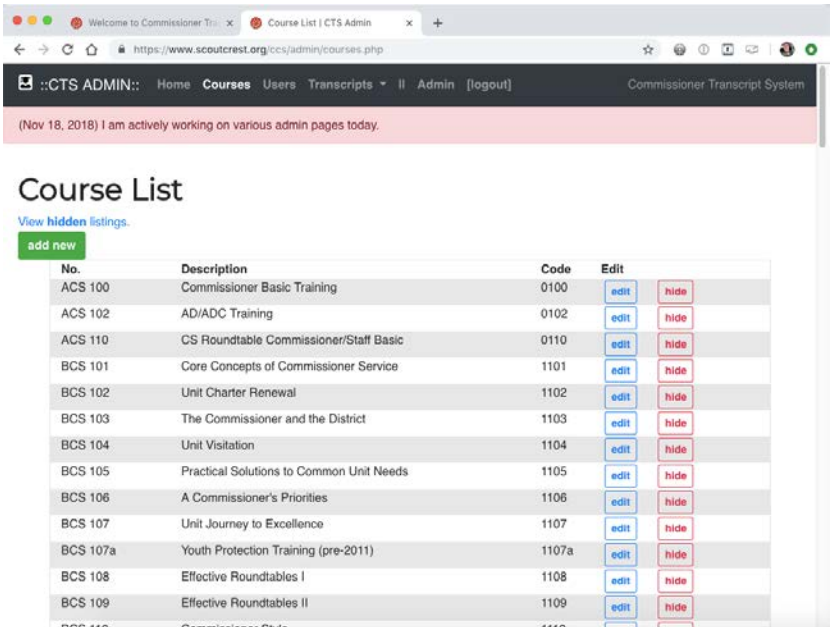
**“Admin: Login” page view**



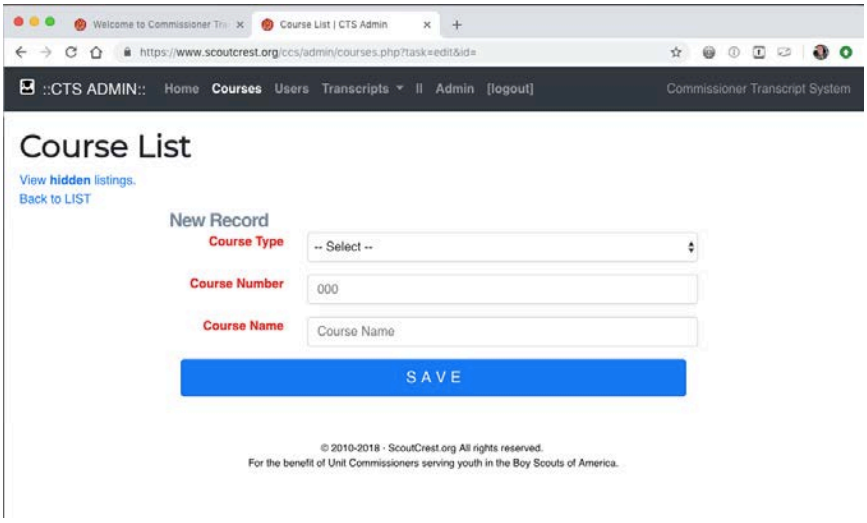
## “Admin: Home” page view

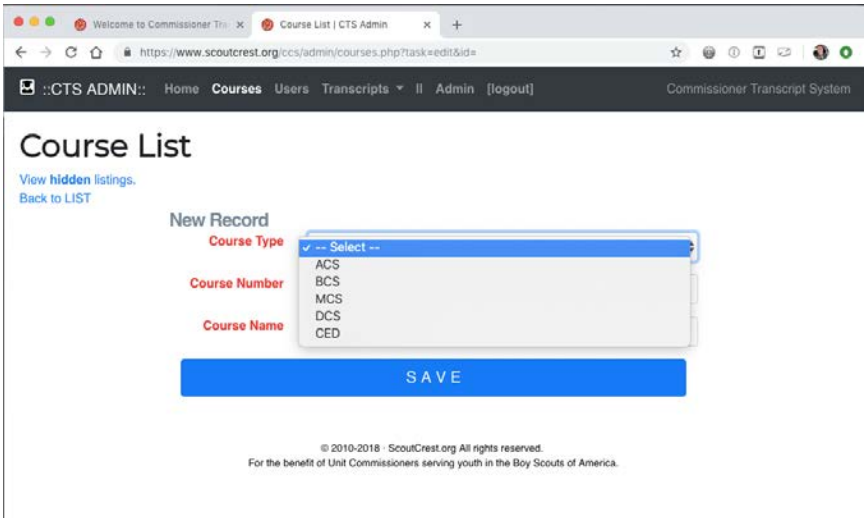


## “Admin: Courses” page view

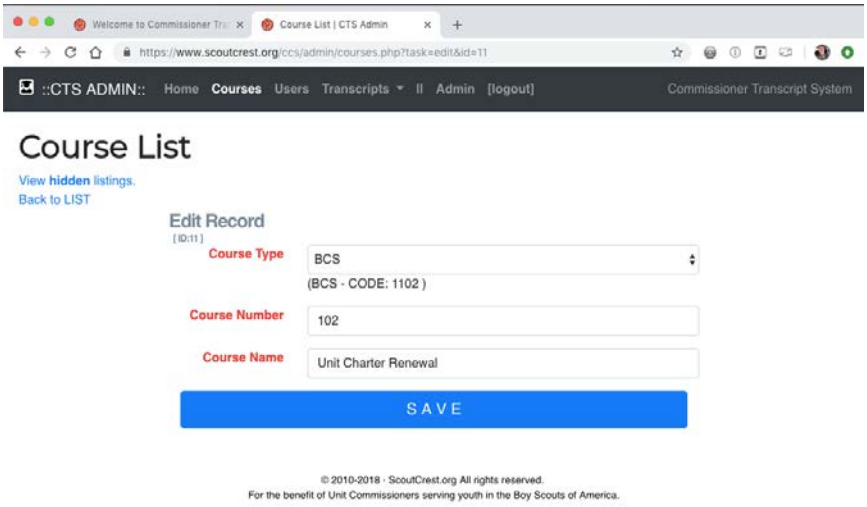


## “Admin: Courses – Add” page view

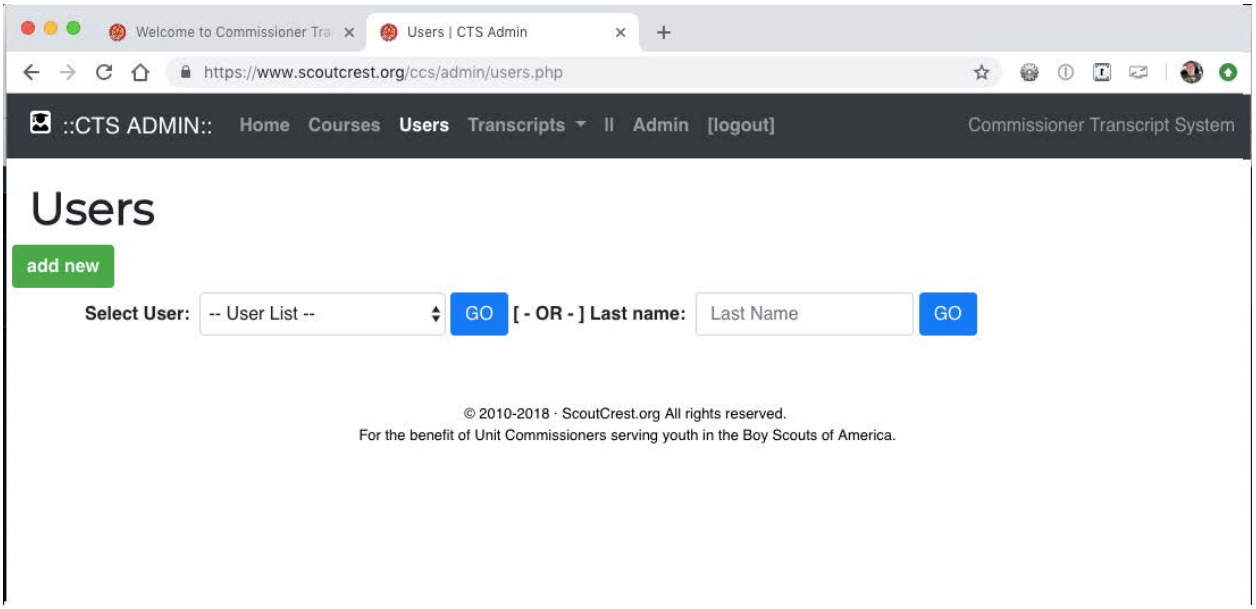


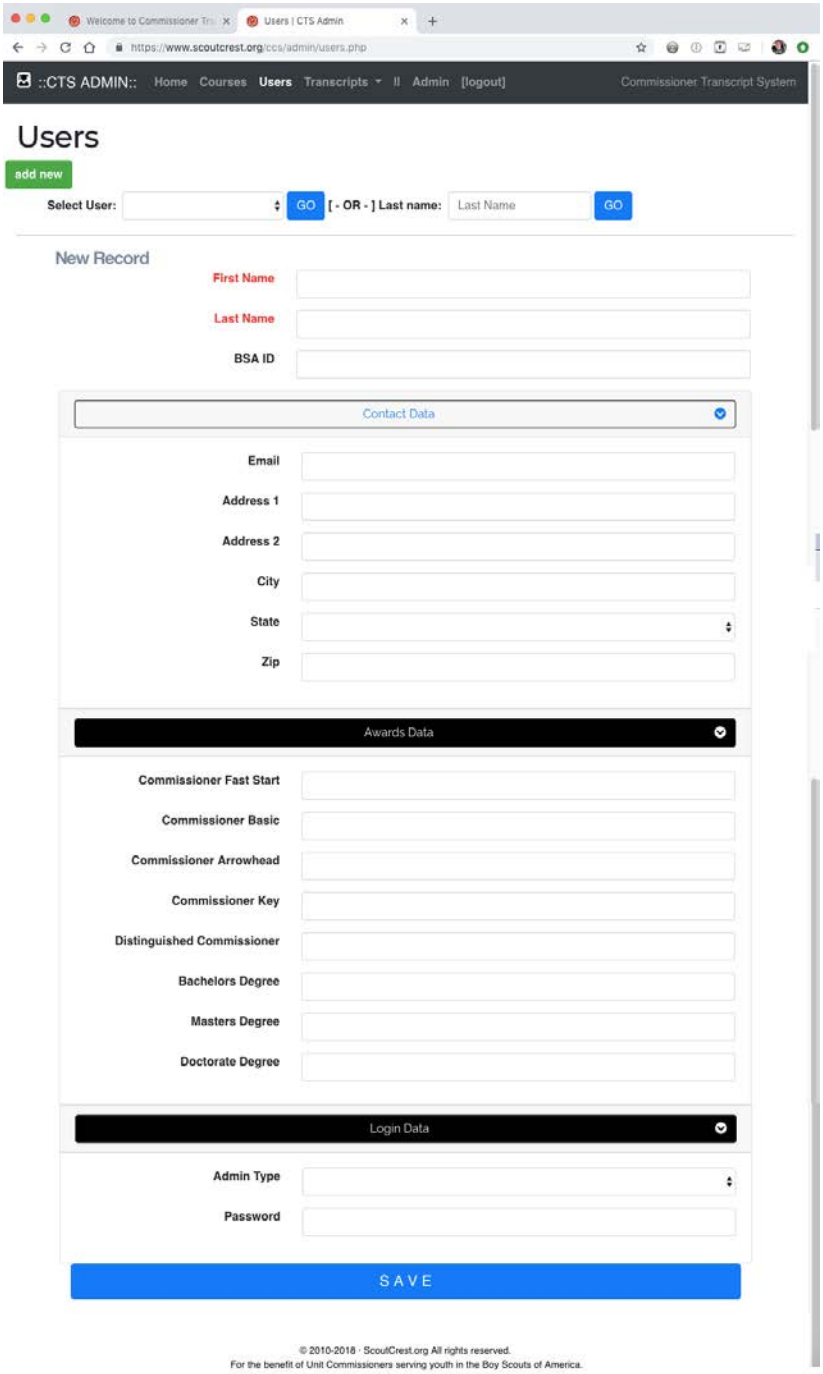
**“Admin: Courses – Edit” page view**



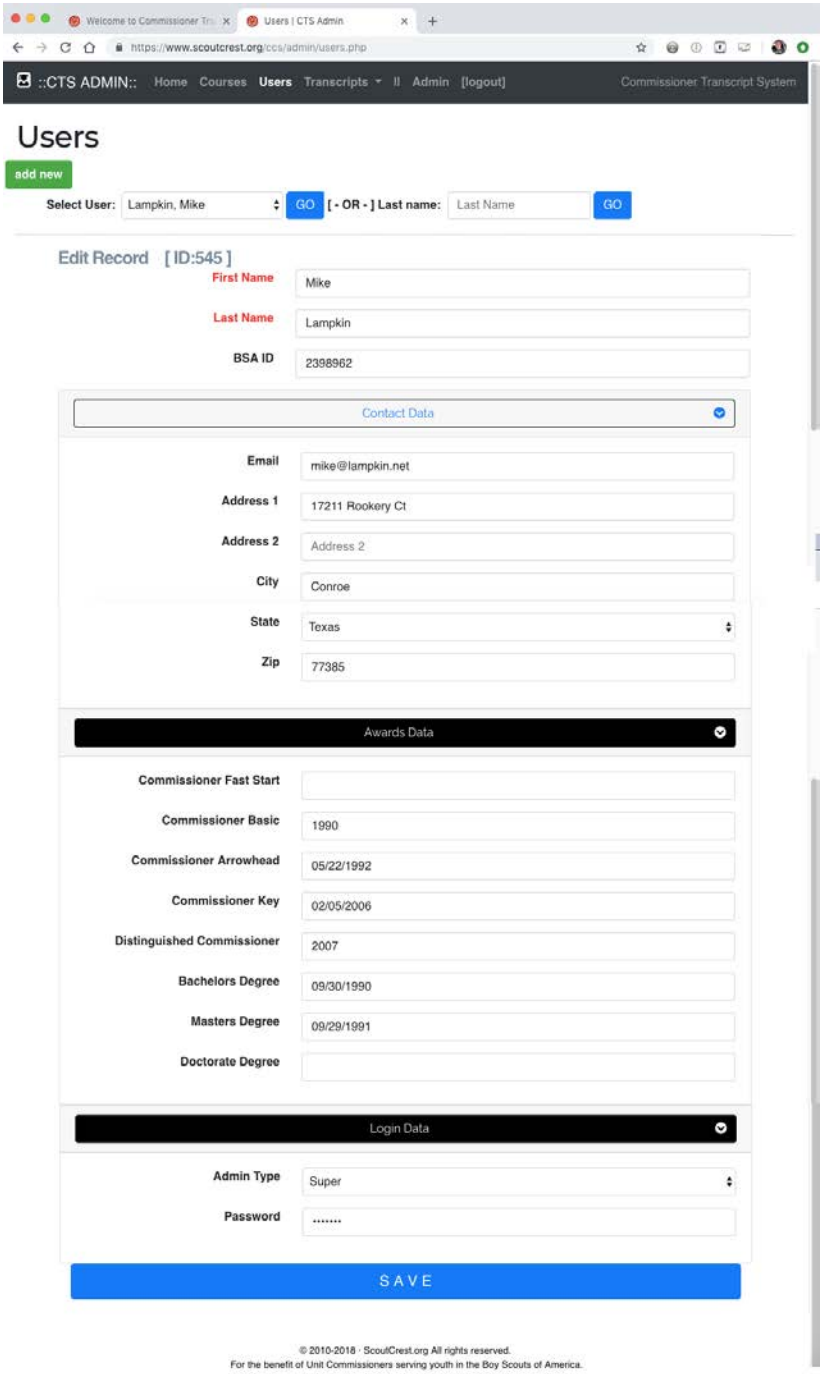
**“Admin: Users” page view**



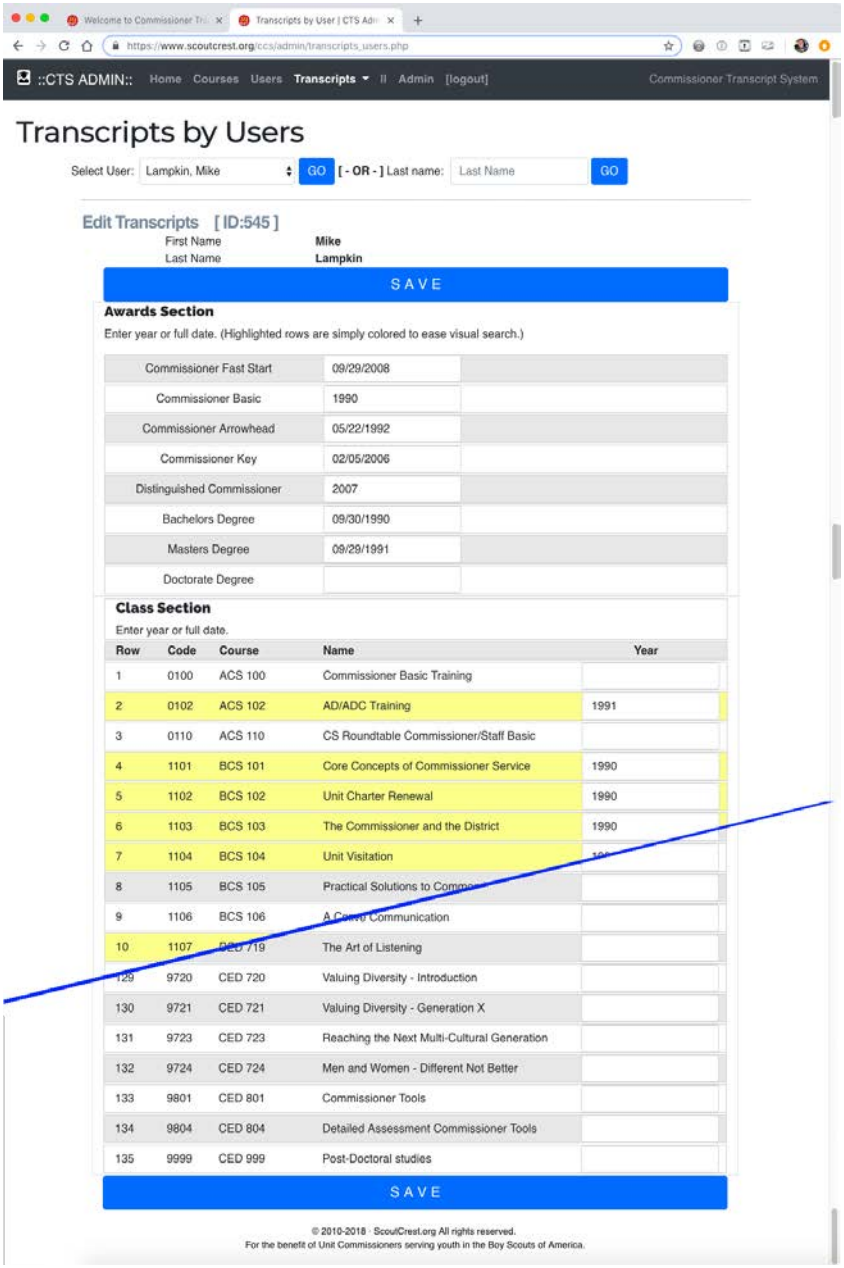
## “Admin: Users – Add” page view



## “Admin: Users – Edit” page view



## "Admin: Transcripts by User – Edit" page view



**“Admin: Transcripts by Course – Edit” page view**