A Self-Study Guide for the Aspiring Journeyman Level Beekeeper
The path of a Certified Level Beekeeper actively growing in beekeeping skills is an adventurous JOURNEY!

The purpose of this Journeyman Self-Study Guide is to give a Certified Level Beekeeper some guidance in their study towards achieving Journeyman Level certification in the South Carolina Master Beekeeper Program.

For clarification or questions, please contact the SCBA Master Beekeeping Committee at scmasterbeekeeper@gmail.com
UNDERSTAND the Requirements:

*Excerpt from the SCBA MBP MANUAL ~ September 2020 Edition*

**JOURNEYMAN Level Beekeeper:**

A. Must be a current South Carolina Beekeeping Association Member.

B. Must own or manage at least 1 colony of honey bees for a minimum of 2 years. Must have held the Certified Beekeeper level for at least 1 full calendar year and should have been a practicing beekeeper for a minimum of 2 years with 1 year after the completion of the Certified Level.

C. Must perform *and be able to document participation* in 5 Public Service Credits (see **APPENDIX B** Public Service Credit Requirements). Two items of supporting documentation are required for EACH Public Service Credit. The Public Service Credit Documentation Form is only a supporting document and should not be the only evidence of a completed PSC. *All PSCs are to be submitted prior to testing.*

D. Must select and perform 3 of the activities listed in the Major/Minor Core Credits for the level of Master Beekeeper (see **APPENDIX C** Major Core Credit Requirements and **APPENDIX D** Minor Core Credits). These will be applied as Minor Credits and may not be applied a second time to an application to the Master level. *All credits are to be submitted prior to testing.*

E. Must score 80% or higher on the written examination (see **APPENDIX F** Examinations and Fees). The written test *may* include but is not limited to material covered on the Certified Level, material covered in the Journeyman Study Guide (located in the SCBA Member Resources), presentations in Journeyman classes, and books/other literature on the Journeyman Beekeeper Reading List (see **APPENDIX A** Suggested BEEKEEPING READING LIST). This examination will cover more information than that required at the Certified Beekeeper Level.

F. Must score 80% or higher on a practical examination administered by the SCBA MBP Committee. The practical examination is composed of 2 parts: a field assessment and a written assessment. Content *may* include but is not limited to: identifying pests, parasites, and pathogens; reading pesticide labels and determining which is the safest to use around bees; identifying beekeeping items; examining honey labels for errors; distinguishing between bees, wasps, hornets, etc.; identifying anatomical structures of a bee, flower, etc.; honey removal/extraction; judging honey for competition; and/or demonstrating basic intermediate beekeeping skills. See **APPENDIX F** Examinations and Fees for more details.
BEGIN accumulating Public Service and Core Credits:

Please refer to the SCBA MBP Manual located on the SCBA website for the specific requirements for accumulating these credits.

Public Service – You most likely have already participated in some activities. Document them! If not, start exploring ways that you can share your love of beekeeping with others in your community and in your bee club.

Core Minor Credits – These credits expose you to the wide variety of Majors offered at the Master Level. Select your three credits from several of the majors, sampling the specialties in order to narrow down your focus of study at the Master Level. More than likely, you may have already participated in some of these activities as well. Thoroughly document your achievement and submit for approval.

ESTABLISH a Beekeeping Library:
The books listed below are recommended as foundational additions to a beekeeper’s library.

Essential Reads:
The Hive and the Honey Bee – Dadant and Sons, Inc. (2015)
Honey Bee Biology and Beekeeping – Dewey Caron, Lawrence Connor (Revised 2013)

Additional Study:
First Lessons in Beekeeping – Keith Delaplane (2007)
Honey Bee Pests, Predators, and Diseases, 3rd Edition – A.I. Root (Morse and Flottum, Eds.) (1998)
The Biology of the Honey Bee – Mark Winston (1991)
Bee Pollination in Agricultural Ecosystems – Rosalind James and Theresa L. Pitts-Singer (2008)
SUBSCRIBE to Beekeeping Periodicals:

Stay current in the developments in beekeeping.

American Bee Journal
Bee Culture

ATTEND Lectures / Conferences / Courses:

Learn from the experts! Allow them to challenge your thinking.

EXPLORE Online Resources:

https://honeybeehealthcoalition.org/varroa/
http://entnemdept.ufl.edu/creatures/MISC/BEES/Tropilaelaps.htm
http://scientificbeekeeping.com/
https://www.vanengelsdorpbeelab.com/publications.html
https://www.clemson.edu/extension/pollinators/apiculture/fact_sheets_publications/index.html

YouTube channels

https://www.youtube.com/user/nationalhoneyshow  (Various Speakers)
https://www.youtube.com/watch?v=PqoZvVu1E7s&t=637s  Dr. Jamie Ellis
https://www.youtube.com/watch?v=RQO3cbD8wLv  Dr. Keith Delaplane
https://www.youtube.com/watch?v=p34t9Jk dqI  Dr. Samuel Ramsey
PREPARE for Testing:

The Journeyman Level written test is a variety of question types: True & False, Multiple Choice, Fill-in the Blank, Matching, Ordering, Identifying, and Short Essay.

QUESTION EXAMPLE: Beekeeper Activity / Pollination

A Certified Beekeeper will know that Pollination is the most important function of the honey bee.
A Journeyman Beekeeper should know that bees only forage upon certain plants for nectar, therefore a late season placement might result in a lack of pollen intake, and therefore fall brood build up could be less than adequate and could result in an over-winter colony demise.
A Master Beekeeper should know important parts of a Pollination Contract; should know more about various plants and equipment needed to successfully work in the area of commercial / agricultural pollination.
A Master Craftsman Beekeeper would know all of the above, and have very specific crop knowledge, and be able to converse on the problems which arise due to movement of colonies.

QUESTION CATEGORIES:
Written Test Questions on the Journeyman Level test are broken down in to the categories below.
(All written tests for each level of the MBP are categorized similarly.)

- Honey Bee Health
- Honey Bee Biology/Anatomy
- Honey Bee Behavior
- Taxonomy (Honey Bees and their Relatives)
- Toxicology and Pesticides
- Pollination and Pollinators
- Pollinator Conservation
- Plants
- Honey / Products of the Hive
- Apiculture History
- SCBA Master Beekeeper Program

An EXAMPLE of depth of detail that is expected at the various levels:
Category: Bee Biology/Anatomy

**Certified level:** head, thorax, abdomen, 2 pair of legs, 5 eyes, 2 pair of wings

**Journeyman level:** Intermediate level of knowledge of body parts; organs; glands, pheromones, bee development stages and lengths of time.
At this level, you should begin using ‘scientific’ terminology. Some examples are: corbicula, hamulii, spermatheca and the following glands, organs, pheromones, and other body parts: Knowledge of various glands; Wax, Nasanov, tarsal, tergal, hypopharyngeal, mandibular, and other organs including the ventricular valve, Johnston's organ, Ocelli, eyes, antennae.

**Master and above levels:** working knowledge of location, scientific designation and function of body parts, glands, and pheromones.
STUDY Details of the following Category Concepts:

We recommend that you establish a notebook divided into the categories listed below. As you attend lectures and read the suggested books, periodicals, and resources -- note the essential principles and concepts to explore, study, and master.

Testing will cover the categories below but will not be limited to the points suggested.

HONEY BEE HEALTH

Be prepared to describe the concepts and practices of Integrated Pest Management (IPM).

What is the difference between IPM and treatment free beekeeping? What about “survival stock” beekeeping?

Know all the major bee diseases and pests by symptom, name of causative agent, and treatment (if available): DWV – Deformed Wing Virus, Israeli Acute Virus, sacbrood, black queen cell, Nosema, chalkbrood, stonebrood, Varroa mites, EFB – European Foulbrood, AFB – American Foulbrood, SHB – Small Hive Beetle

Know of the Tropilaelaps mite and its current status in South Carolina.

Know IPM control methods for each disorder, if available

Review the most current information on bee decline or “CCD.” What are its causes? What can be done about them? Is it currently considered a genuine “threat” to the Honey bee population?

What are some principles of epidemiology that can be applied for bee health? Is hive density important? Propolis?

What are some important bee traits for genetic pest resistance?
HONEY BEE BIOLOGY / ANATOMY

What are the three criteria of a “eusocial” species?

Why do honey bees make honey?

What is the annual life cycle of honey bees? Why do they swarm so early in spring?

What is polyandry and why is it important?

How many chromosomes do bees have?

What is the difference between homozygous genes and heterozygous genes.

Why is inbreeding such a problem in breeding programs? What is the biggest symptom of inbreeding?

What are the long-term triggers of swarming and near-term triggers? How can a beekeeper manage each of these to reduce swarming?

What are some of the age-based changes in worker tasks?

What are the most economically important honey bee races? What are their scientific names?

How do bees regulate nest temperature? Both cold and heat.

What is the superorganism?

Understand honey bee morphology as it pertains to beekeeping. What is the crop? The corbicula, the antenna cleaner, mandibular gland, etc.
**BIOLOGY OF HONEY HOARDING**

The importance of C.L. Farrar’s 1930s research on colony population and honey hoarding

The importance of colony density on honey hoarding – when should you super and when should you crowd them?

How did Farrar’s knowledge revolutionize beekeeping? What did beekeepers think about swarming pre- vs. post-Farrar?

How do bees use the recruitment dance to optimize honey storage? What stimulus makes a bee forage for nectar vs. pollen vs. water?

How can beekeepers reduce swarming? What are the benefits of swarm control?

---

**TAXONOMY (HONEY BEES and their RELATIVES)**

What are the differences between wasps and bees from the standpoint of evolutionary ancestry, diet, morphology, and life strategy?

What is mimicry and how can one distinguish a bee mimic from a real bee?

What is the benefit of mimicry to the mimic?

What are the characteristics the order Hymenoptera?

Why does the Honey bee fit in the family Apidae?

What one clear unambiguous characteristic can distinguish a bumble bee from a carpenter bee?

What are some environmental benefits provided by wasps?

What is the difference between solitary, perennially social, or annually social species? Which strategy describes honey bees? Bumble bees? Cicada killers?

What is the status of the Giant Asian Hornet in South Carolina?
TOXICOLOGY AND PESTICIDES

Measures of toxicity, the LD<sub>50</sub>, LC<sub>50</sub>, chronic vs. acute toxicity

Insecticide formulations – wettable powder, dust, solution, granules and the effects of each for honey bee toxicity

Management measures for minimizing insecticide exposure: timing of application, residual toxicity times, reentry intervals

How to read an insecticide label and judge its potential hazard to bees

Special considerations for urban mosquito spray applications: drift, timing of application, whether to cover hives or move them

Symptoms of acute bee kill; symptoms of chronic bee kill

Restorative therapy for insecticide injured colonies

POLLINATION

Sexual parts of a flower

Measures of “good” pollination: fruit-set, pollen surface deposition on stigma, number of ovules fertilized

Self-fertile vs. self-sterile crops and implications for pollination dependence

Fruit types and their implications for pollination dependence: berry, pome, aggregate fruit, stone

Why is California almond such a huge pollination event?

How can honey bee pollination efficacy be optimized?

What are the world-wide dynamics affecting pollination demand?

What is flower fidelity?
**POLLINATOR CONSERVATION**

What are the main criteria for supplemental bee forage plants?

Should supplemental forage plants be placed next to a crop to be pollinated?

How can a landowner encourage solitary bee nesting?

**PLANTS**

What are the differences between asexual and sexual reproduction?

Can you identify the difference between a male and female flower?

What part does the bee play in pollination?

Do all plants require pollination by Honey bees?

What plants benefit the most from Honey bee pollination?

How does the weather affect plants/flowers that directly affects the nectar flow?

**HONEY / PRODUCTS OF THE HIVE**

What are the pros / cons of using heat in the extracting process?

What are the guidelines for a legally-labeled jar of honey?

Be ready to distinguish good, from fair, from poor presentation of honey

What are the criteria for comb honey? Chunk honey?

What is HMF and why does it matter?

What are the causes of crystallization?
APICULTURE HISTORY

Who was credited with bringing the first Honey bees to America and when?

Why is Lorenzo Langstroth’s removable frame concept important to us today?

From 1850 – 1900, the Golden Age of Beekeeping, there were numerous discoveries and advancements, be prepared to identify the works of; Dzierzon, Vandervort, Root, Peabody, Quinby, and their contemporaries.

What is “bee space?”

Is there any evidence for beekeeping prior to the 1850’s? What were they?

SCBA MASTER BEEKEEPING PROGRAM

What are the levels of Certification within the MBP?

What are Public Service Credits and how does one accumulate them?

How many Public Service Credits are required to qualify to test for Journeyman?

How many for Master?

Does every level require a written exam? An oral exam?